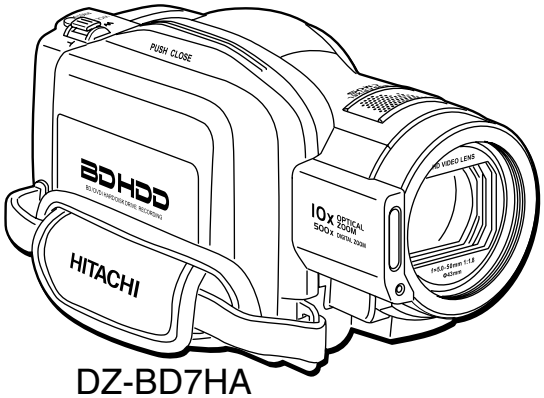
HITACHI

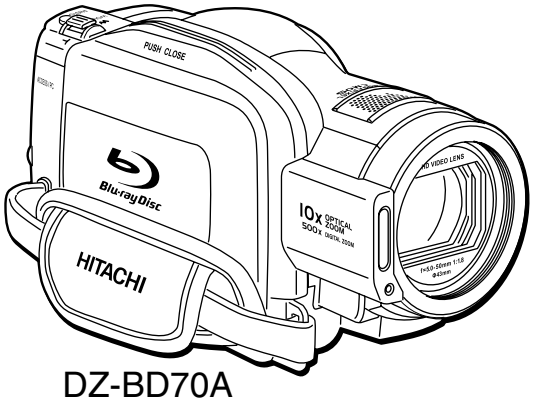
TK | No. 0706E

SERVICE MANUAL

DZ-BD7HA
DZ-BD70A



DZ-BD7HA
(Hybrid BD Camcorder)



DZ-BD70A
(BD Camcorder)

DVD VIDEO RAM | RAM COMPATIBLE | Blu-ray Disc™ | SD

HDD hard disk | HDMI™

DO NOT RESELL OR DIVERT IMPROPERLY

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

HYBRID BD CAMCORDER
BD CAMCORDER

Updated 10/01/2007

October 2007

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PARTS LIST (Click list to go to page)

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Parts Lis BR1 ~ I13501
Parts List I3600 ~ L3508
Parts List L3509 ~ P4200
Parts List P4500 ~ Q5200
Parts List Q5201 ~ X3700

1 Safety Precaution for Repair

1-1 Cautions

CAUTION

Lithium battery; danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

When replacing the lithium battery it is important to use the same type and connect it correctly.

WARNING:

- Lithium batteries contain dangerous chemicals.
- Handle and dispose of with great care.
- Do not throw in a fire.
- Do not short circuit it.
- For disposal place in a plastic bag and put in waste bin.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

CLASS 1
LASER PRODUCT

CAUTION

This product contains a laser diode of higher class than 1. To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.

CAUTION

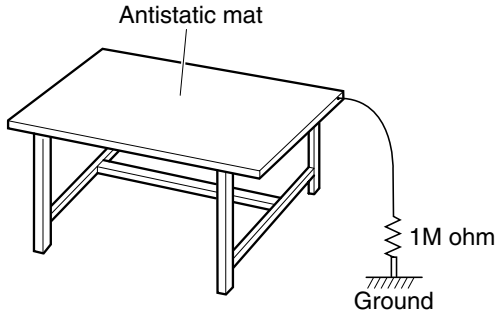
There is a high-voltage section inside the camcorder: When repairing or inspecting it, take great care to prevent electric shock: Use an isolating transformer, wear gloves, etc.

1-2 Electrostatic Protection Measures

Semiconductor components can be damaged by static electricity charged on clothes, human body, etc. Take great care when handling components to avoid electrostatic damage, and perform servicing in an environment where grounding is complete.

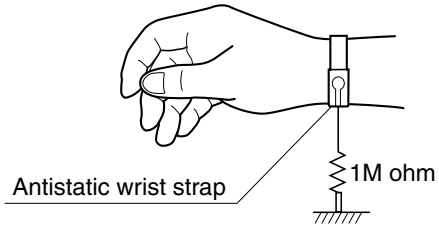
(1) Grounding work bench

Lay out an antistatic mat on work bench, and then use the ground plate to ground the work bench.



(2) Grounding human body

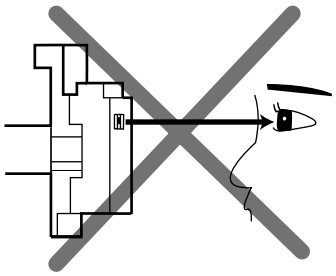
Use an antistatic wrist strap to discharge any static electricity charged on the body. Also, use a tester for wrist strap to make sure that the wrist strap is working normally. Note, however, that static electricity charged on clothes will not be discharged by wrist strap: Therefore do not allow your clothes to touch the semiconductor components.



1-3 Cautions When Handling BD or DVD Drive

The optical pickup in BD or DVD drive has a high precision structure: Be sure to observe the following cautions.

1) Do not subject optical pickups to any severe vibrations or impact during movement, installation or disassembly.
2) When performing repair work, do not perform disassembly any further than that described in this manual.
3) Never turn the semi-variable resistors for adjustment in optical pickup or BD or DVD drive.
4) NEVER look into the objective lens in optical pickup or directly view the laser light: You could lose your eyesight.



Do not directly look at laser light from pickup.

1-4 Cautions When Handling 1.8-inch HDD (Hard Disc Drive) for Camcorder

A HDD is a delicate device, very susceptible to vibrations or impact. Even if the HDD seems to operate normally immediately after vibrations or impact, a fault may occur after some time. Therefore, when servicing the camcorder, take special care with the following:

(1) Cautions when unpacking

1) Even if the HDD is still in the packing box, grasp it at the sides or the ends of the box as shown in the figure below: Grasping the top and bottom surfaces of HDD could cause the HDD to be faulty.
2) Do not subject the camcorder to any impact when placing it on desk, etc.
Which could damage the HDD.
3) If condensation occurs, leave the camcorder for at least 3 hours without turning it on, so that it can adapt to the surrounding environment.The disc may be broken.

(2) Cautions during recording/playback/editing/dubbing

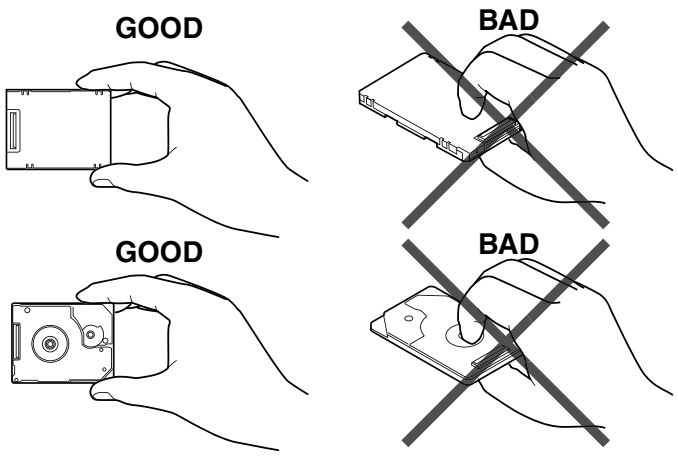
1) Do not remove the power supply (battery or AC adapter/charger) during recording, playback, editing or dubbing: Doing so could damage the data on HDD. Always set the power switch to "OFF" before removing the power supply.
2) Do not subject the camcorder to any vibration as far as possible during recording, playback, editing or dubbing. Also never strike the camcorder: The head will hit the disk, which could damage the HDD.

(3) Caution during repacking

1) Use the packing material for the corresponding model. This model uses a packing material that is excellent for impact resistance: Using other packing material could result in damage to the camcorder.

(4) Cautions when handling unassembled HDD

1) Grasp the HDD on the sides as shown below, whether or not it is in a shield case. Do not pinch the top and bottom surfaces, or push the shield case: Doing so could cause a fault.
2) Do not touch any terminals: Static electricity due to touching could cause a fault.
3) Do not hold or place two HDDs on top of each other.
4) Do not drop the HDD or hit it against anything. On a hard work bench, a fall from even approx. 5 mm could result in damage.
5) Do not place the HDD near a magnetized object: Since the HDD uses magnetic recording, a magnetized object near the HDD could cause the HDD to malfunction or lose data.



1-5 Lead-Free Solder

The printed circuit board that uses lead-free solder is adopted. To protect the global environment, use the recommended lead-free solder also during servicing.
Read and observe the following before soldering:

Caution

ALWAYS wear protective goggles during soldering so that no solder smoke or scattered solder enters the eye. Lead-free solder may scatter at high temperatures of 600°C.

(1) Identification of circuit boards that use lead-free solder

" Pb A30CS " is stamped or noted with pattern letter on circuit boards that use lead-free solder.

(2) Characteristics of lead-free solder

The components of lead-free solder used are as follows. The melting point of lead-free solder is 30-40°C higher than that of lead based solder:

Point to be soldered	Composition of alloy (wt%)
For reflow	Solder paste: Sn-3Ag-0.5Cu
For dip	Bar solder: Sn-0.6Cu

Melting temperature: Approx. 220°C

(3) Lead-free solder for servicing

Use the following lead-free solder for servicing:
Recommended lead-free solder and composition of alloy (wt%): Sn-3.0Ag-0.5Cu or equivalent

Information:
For composition of alloy, Sn is tin; Ag is silver; Cu is copper; Bi is bismuth; Pb is lead.

(4) Soldering iron for servicing

The temperature of soldering iron tip must be adjusted according to the points to be soldered: Use an antistatic soldering iron with thermal control function.
When removing components, take care not to damage any surrounding component or pattern. When attaching components, observe the heating time in the following table so that the components are not destroyed by heat.

Tip temperatures for different soldering points:

oint to be soldered	Tip temperature
Surface-mounted (chip) parts [other than those shown below]	320 ± 30°C [heating time: less than 5 seconds]
Surface-mounted (chip) parts [for DVD cameras, cellular phones only]	350 ± 10°C [heating time: less than 3 seconds]
Discrete parts	380 ± 30°C
Chassis, metal shield, etc.	420 ± 30°C

(5) Cautions when using lead based solder

It is recommended that you use lead-free solder when servicing, but it is also possible to service using lead based solder. However, if lead based solder is used for servicing, take care with the following:

1) Before using lead based solder, remove the lead-free solder completely from the point to be soldered.
2) For additional soldering for repair, set the soldering iron tip temperature for lead-free solder, mix lead based solder and lead-free solder sufficiently. Do not perform any repair using the bare soldering iron tip without adding solder, since it will cause secondary failure due to lack of strength.

1-6 Notes When Using Service Manual

(1) Value units used in parts list

Certain symbols are indicated as shown below for value units of resistors, capacitors and coils in parts list. When you read them, note the following regular indications:

Parts	Indication in list	Regular indication
Resistor	KOHM	kΩ
Capacitor	UF	μF
	PF	pF
Coil	UH	μH
	MH	mH

(2) Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations. Certain symbols are indicated for value units: When you read them note the regular indications in tables below:

[Resistors]

Item	Indication
Value	No indication ..... Ω K ..... kΩ M ..... MΩ
Tolerance	No indication ..... ±5% (All tolerances other than ±5% are indicated in schematic diagrams)
Power capacitance	No indication ..... 1/8W (1/16 W for leadless resistors with no indication) All capacitances other than the above are indicated in schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication ..... μF P ..... pF
Dielectric strength	No indication ..... 50V (All dielectric strengths other than 50 V are indicated in schematic diagrams)

[Coils]

Item	Indication
Value	μ ..... μH m ..... mH

(3) Identifying sides A/B in circuit board diagrams

1) Board with pattern on one side only and parts on both sides:

Side A: Shows discrete parts.

Side B: Shows leadless parts, viewed from the pattern side.

2) Board with patterns and parts on both sides:

Sides A and B are identified without any predetermined rules.

(4) Indicating model names

The indication of models is defined as follows:

1) The common parts of model names are omitted.
   Example: When indicating VM-D975LA and VM-D875LA:
   VM-D975LA/D875LA, D975LA/D875LA
2) If there is no difference in models going to different destinations, the indication of destination is omitted.
   Example: When indicating DZ-MV350E(AU) and DZ-MV350E(SW): DZ-MV350E

(5) Differences in parts between schematic and circuit board diagrams

If some parts are different between models, asterisks "*" are attached to the circuit numbers. Check the parts difference tables in diagrams or parts location search system for details.

2 General Description

2-1 Overview

The DZ-BD7HA and DZ-BD70A can record High-Definition (HD) images on a Blu-ray disc (BD).
The DZ-BD7HA also has a 30 GB HDD (1.8-inch), and so it can record high-definition (HD) images on the HDD.
Since the DZ-BD7HA and DZ-BD70A are compatible with various discs, as shown in Table 2-1-1, it can record movies directly to a disc or the HDD, and also easily dub movies recorded on the HDD to a disc (dubbing from a disc to HDD is not possible).
The only major differences between the DZ-BD7HA and DZ-BD70A are functions and specifications based on whether the HDD is mounted or not.

Table 2-1-1 DZ-BD7HA/BD70A Recording/Playback Compatibility

<table>
<tr><th>Model</th><th>Recording media</th><th>Movie recording/playback</th><th>Photo recording/playback</th></tr>
<tr><td>DZ-BD7HA</td><td>1.8-inch HDD (30GB)</td><td rowspan="3">Possible (HD)</td><td rowspan="3">Impossible</td></tr>
<tr><td rowspan="5">DZ-BD7HA
DZ-BD70A</td><td>8cm BD-RE</td></tr>
<tr><td>8cm BD-R</td></tr>
<tr><td>8cm DVD-RAM</td><td rowspan="3">Possible</td><td>Only playback possible (recording impossible)</td></tr>
<tr><td>8cm DVD-RW</td><td rowspan="2">Impossible</td></tr>
<tr><td>8cm DVD-R</td></tr>
<tr><td>SD Memory Card</td><td>Impossible</td><td>Possible</td></tr>
</table>

Information:
The DZ-BD7HA/BD70A cannot use +RW.

2-1-1 Servicing method

Refer to the following table and perform the designated, appropriate servicing. Any changes that occur in the service method will be published using service bulletin, etc.
Do not perform any servicing other than that described in this manual.

Table 2-1-2 Servicing method

Parts Name		Servicing method
(a)	HDF circuit board (DZ-BD7HA only)	Circuit board replacement
(b)	BD drive unit	Unit replacement
(c)	Flash Unit	Unit replacement
(d)	FRT circuit board	Component replacement
(e)	SFF circuit board	Component replacement
(f)	HDD unit (DZ-BD7HA only)	Unit replacement
(g)	LCD unit	Unit replacement
(h)	Lens unit	Unit replacement
(i)	5MCMOS circuit board	Component replacement
(j)	GYRO circuit board	Component replacement
(k)	MIC circuit board	Component replacement
(l)	EVF unit	Unit replacement
(m)	MAN circuit board	Component replacement or circuit board replacement
(n)	AEL circuit board	Component replacement
(o)	USB circuit board	Component replacement
(p)	LAF circuit board	Component replacement
(q)	AVS circuit board	Component replacement
(r)	EXL circuit board	Component replacement

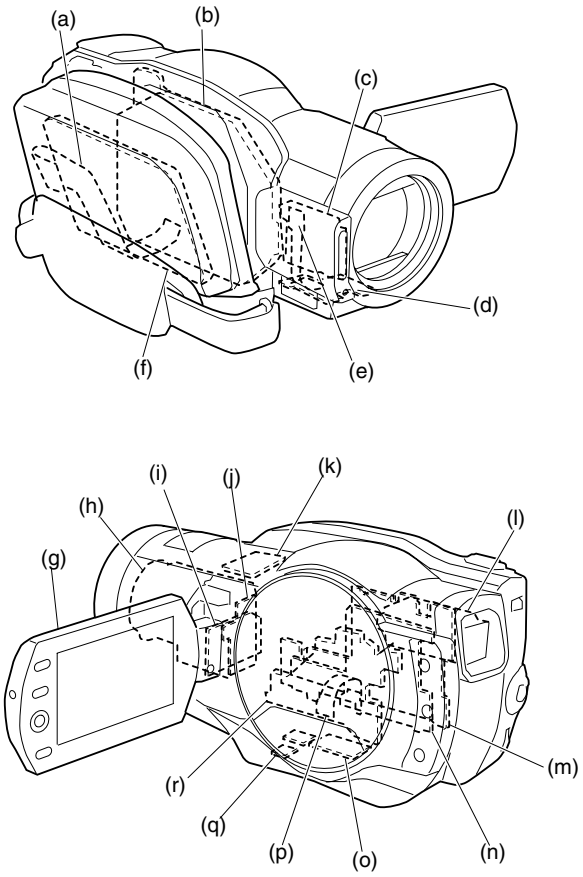


Fig. 2-1-1 Name of the circuit board/unit

2-2 Features

Compatibility with Blu-ray disc (BD)

The new camcorder is compatible with BD discs (BD-R and BD-RE) that have a recording capacity five times that of a DVD.

High-definition (HD) images can be recorded

High-definition images (1920 x 1080 resolution) can be recorded on BD and HDD(*1).

*1: DZ-BD7HA only. The DZ-BD70A does not have a HDD.

High-resolution 5.3 mega pixel CMOS sensor mounted

The 1/2.8-inch CMOS sensor has approx. 5,300,000 total pixels, 2,070,000 effective for movies, and 4,320,000 effective for stills.

DZ-BD7HA has a built-in 30 GB HDD.

The DZ-BD7HA incorporates a 1.8-inch, 30 GB HDD for recording movies. It allows recording of high-resolution (1920 x 1080) images for approx. four hours.

Incompatible with +RW

No recording can be made on +RW, nor can a +RW recorded on another model be played back.

2-3 Specifications

Item		Specifications
Image Sensor		1/2.8-inch CMOS sensor
	Total number of pixels	Approx. 5,300,000
	Number of effective pixels	Movie: Approx. 2,070,000 Still: Approx. 4,320,000
Lens		F1.8 – 3.0, f=3/16" – 1-15/16"(5 – 50mm)
	Filter diameter/ Thread pitch	1-11/16"(43mm) / 0.75mm
Focus		Auto/Manual
Zoom		Optical 10×, 40× – 500× with digital zoom added (Optical 10× only for still)
Required minimum illumination		Auto mode: 24 lx
Viewfinder		0.2-inch color TFT (approx. 200,000 pixels)
LCD monitor		2.7-inch color TFT (approx. 211,200 pixels)
Image stabilizer		Electronic type
Self-timer recording		Still recording only
External microphone jack		3.5mm stereo mini-jack (a plug-in power type microphone only)
Capacity of built-in HDD (DZ-BD7HA only)		Approx. 30 GB
Recording mode		Movie (with sound) Hi-Vision (High Definition) image (movie) quality (HD Video mode) Standard Definition image (movie) quality (SD Video mode) Still (with SD memory card)

Item		Specifications
Maximum recordable time	HDD (DZ-BD7HA Only)	HX mode: Approx. 4 hours HF mode: Approx. 5 hours HS mode: Approx. 8 hours
	BD	HX mode: Approx. 60 minutes HF mode: Approx. 80 minutes HS mode: Approx. 120 minutes
	DVD (per side)	SX mode: Approx. 20 minutes SF mode: Approx. 30 minutes
Maximum number of recordable stills	SD memory card (when using 1GB card)	Approx. 400
Movie recording pixels		HX: 1920 × 1080 HF/HS: 1440 × 1080 SX/SF: 720 × 480
Recordable disc		8cm BD-RE 7.5 GB 2× (Ver. 2.1) 8cm BD-R 7.5 GB 2× (Ver. 1.1) 8 cm DVD-RAM (conforming to DVD-RAM Ver. 2.1) 8 cm DVD-RW (conforming to DVD-RW Ver. 1.1, 2× speed [2×/1×]) 8 cm DVD-R disc (conforming to DVD-R for General Ver. 2.0)
Recordable card		SD memory card
Recording format	HDD (DZ-BD7HA only)	Movie: Equivalent BD-RE Ver. 3.0 Sound: Dolby Digital
	BD-RE	Movie: BD-RE Ver. 3.0 Sound: Dolby Digital
	BD-R	Movie: BD-R Ver. 2.0 Sound: Dolby Digital
	DVD-RAM/DVD-RW (VR-mode)	Movie: Conforming to DVD video recording (DVD-VR) format Sound: Dolby Digital
	DVD-RW (VF-mode)/DVD-R	Movie: Conforming to DVD video format Sound: Dolby Digital
	Card	Still: JPEG standard (2400 × 1800 pixels) When capturing still images: 1920 × 1080 pixels (HDD/BD) 640 × 360 pixels (DVD)
Audio playback format		Dolby Digital, MPEG Audio layer 2, linear PCM
Jacks		HDMI output terminal 1 Component output ×1 Video/audio output ×1 MIC jack ×1 PC connection terminal (connected to PC USB port) ×1
Battery system		Lithium-ion
Power consumption (when recording in HX mode with LCD monitor off)		DZ-BD7HA: Approx. 5.7 W (during HDD use) DZ-BD70A: Approx. 6.7 W (during BD-RE use)
Dimensions (W × H × D, including supplied battery pack, excluding hand strap)		DZ-BD7HA: Approx. 3- 1/8" × 3-7/16" × 6-1/2" (Approx. 80 × 87 × 165 mm) DZ-BD70A: Approx. 3- 1/16 × 3-7/16" × 6-1/2" (Approx. 77 × 87 × 165 mm)
Operating temperature (humidity)		32 – 104ºF (0 – 40ºC) (less than 80%). 32 – 86ºF (0 – 30ºC) when connected to PC

Item	Specifications
Allowable operating altitude (when using HDD, DZ-BD7HA only)	9,842 feet (3,000 m) or less
Weight (without battery pack nor BD/DVD)	DZ-BD7HA: Approx. 630g
	DZ-BD70A: Approx. 575g
Total weight when recording (When using the battery pack DZ-BP14S)	DZ-BD7HA: Approx. 705g
	DZ-BD70A: Approx. 650g
Provided accessories	AC adapter/charger (DZ-ACS3) Battery (DZ-BP14S) AV/S output cable Component cable Infrared remote control Lithium battery for remote control Power cable DC power cord Software CD-ROM PC connection cable Single-sided 8cm BD-RE disc Disc cleaning cloth

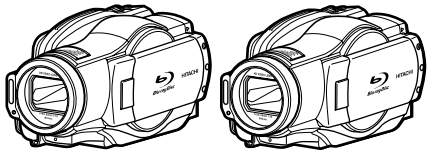
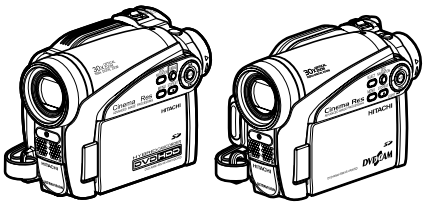
Specifications are subject to change without notice for the purpose of improvement.

Specifications of AC Adapter/Charger [DZ-ACS3]

Power supply	100 - 240 V AC, 50/60 Hz
Input capacity	19W
DC output (max.)	1.2 A
Charge output	8.4 V, 0.65A
Weight	100 g
External dimensions (W × H × D)	61 × 32 × 91 mm
Ambient temperature for operation	32 – 104°F (0 - 40°C)
Allowable relative humidity	20 - 80%

2-4 Major Differences from Previous Models

← : Same as on left

Item		DZ-BD7HA/BD70A	DZ-HS500A/GX5080A
Dimensions (W × H × D) and shape (including supplied battery pack, excluding hand strap)		DZ-BD7HA: Approx. 3-1/8" × 3-7/16" × 6-1/2"	DZ-HS500A: Approx. 2-23/32" × 3-9/16" × 5-3/16"
		DZ-BD70A: Approx. 3-1/16" × 3-7/16" × 6-1/2"	DZ-GX5080A: Approx. 2-1/2" × 3-9/16" × 5-3/16"
		 DZ-BD7HA DZ-BD70A	 DZ-HS500A DZ-GX5080A
Weight		DZ-BD7HA: Approx. 630g	DZ-HS500A: Approx. 505g
		DZ-BD70A: Approx. 575g	DZ-GX5080A: Approx. 425g
Built-in HDD		DZ-BD7HA: Provided (30-GB 1.8-inch)	DZ-HS500A: ←
		DZ-BD70A: Not provided	DZ-GX5080A: ←
Disc for recording movies		8cm BD-RE 8cm BD-R 8cm DVD-RAM 8cm DVD-RW 8cm DVD-R	8cm DVD-RAM 8cm DVD-RW 8cm DVD-R 8cm +RW
Media for recording still		SD memory card	←
HD movie recording/playback		Possible (usable media: HDD/BD-RE/BD-R)	Impossible
Image sensor		1/2.8-inch CMOS sensor	1/6-inch CCD sensor
	Total number of pixels	Approx. 5,300,000 pixels	Approx. 680,000 pixels
	Number of pixels for Movie	Approx. 2,070,000 pixels	Approx. 340,000 pixels
	Number of pixels for still	Approx. 4,320,000 pixels	Approx. 340,000 pixels
Lens		F1.8 - 3.0 f = 3/16" – 1-15/16" (5 – 50 mm)	F2.0 - 4.1 f = 1/16" – 2-11/16" (2.3 – 69 mm)
Zoom		Optical 10x, 40x - 500x with digital zoom added (Optical 10x only for still)	Optical 30x, 120x - 1500x with digital zoom added (120x for still)
Filter diameter / Thread pitch		1-11/16" (43 mm) / 0.75 mm	1-5/16" (34 mm) / 0.5 mm
Required minimum illumination		24 lx (Auto mode)	0.3 lx (Low light mode)
Internal flash		Provided	Not provided
Internal LED light		Not provided	DZ-HS500A: Not provided
			DZ-GX5080A: Provided
Viewfinder		0.2-inch color (equivalent to approx. 200,000 pixels)	←
LCD monitor		2.7-inch color TFT (approx. 210,000 pixels)	2.7-inch color TFT (approx. 120,000 pixels)

Item	DZ-BD7HA/BD70A	DZ-HS500A/GX5080A
Power consumption (when recording with LCD monitor off)	DZ-BD7HA: Approx. 5.7 W (HDD used, HX mode)	Approx. 3.2 W (DVD-RAM used. FINE mode)
	DZ-BD70A: Approx. 6.7 W (BD-RE used, HX mode)	
Maximum time of recordable movie to HDD (For DZ-BD7HA and DZ-HS500A)	HX: Approx. 4 hours (Variable: Approx. 15 Mbps)	XTRA: Approx. 7 hours (Variable: Approx. 3 - 10 Mbps)
	HF: Approx. 5 hours (Variable: Approx. 11 Mbps)	FINE: Approx. 11 hours (Fix: Approx. 6 Mbps)
	HS: Approx. 8 hours (Variable: Approx. 7.5 Mbps))	STD: Approx. 23 hours (Fix: Approx. 3 Mbps)
Maximum time of recordable movie to BD	HX: Approx. 60 minutes (Variable: Approx. 15 Mbps)	------
	HF: Approx. 80 minutes (Variable: Approx. 11 Mbps)	------
	HF: Approx. 120 minutes (Variable: Approx. 7.5 Mbps)	------
Maximum time of recordable movie to DVD (per side)	SX: Approx. 20 minutes (Variable: Approx. 9 Mbps)	XTRA: Approx. 18 minutes (Variable: Approx. 3 - 10 Mbps)
	SF: Approx. 30 minutes (Variable: Approx. 6 Mbps)	FINE: Approx. 30 minutes (Fix: Approx. 6 Mbps)
	------	STD: Approx. 60 minutes (Fix: Approx. 3 Mbps)
Number of pixels for movie	HX(*1): 1,920 × 1,080 pixels	------
	HF/HS(*1): 1440 × 1,080 pixels	------
	SX/SF(*1): 720 × 480 pixels	XTRA/FINE: 720 × 480 pixels
	------	STD: 352 × 480 pixels
Audio recording format	Dolby Digital	←
Audio playback format	Dolby Digital, MPEG Audio layer 2, Linear PCM (LPCM)	←
Maximum number of recordable Stills (32MB SD memory card used)	Approx. 10	FINE: Approx. 180
		NORM: Approx. 240
		ECO: Approx. 370
Number of pixels for JPEG Still during camera recording	2,400 × 1,800 pixels (4 : 3)(*2)	640 × 480 pixels (4 : 3)
Number of pixels for JPEG Still during external input recording	Recording impossible (with no external input function provided)	DZ-HS500A: 640 × 480 pixels (4 : 3)
		DZ-GX5080A: Recording impossible (with no external input function provided)
Number of pixels for JPEG Still during capture	HDD/BD (16 : 9)(*3) 1,920 × 1,080 pixels	16 : 9 640 × 360 pixels
	DVD (16 : 9)(*3) 640 × 360 pixels	
	DVD (4 : 3)(*3) 640 × 480 pixels	4 : 3 640 × 480 pixels

*1: The screen aspect ratio of movie that can be recorded on the DZ-BD7HA/BD70A is only 16:9, no 4:3 movie can be recorded.

*2: The screen aspect ratio of still that can be recorded on the DZ-BD7HA/BD70A is limited to 4:3. No 16:9 still can be recorded.

*3: The aspect ratio of a still captured from a 16:9 movie recorded on the DZ-BD7HA/BD70A and other models will be 16:9. The aspect ratio of a still captured from a 4:3 movie recorded on other models will be 4:3.

Item		DZ-BD7HA/BD70A	DZ-HS500A/GX5080A
Dubbing function		DZ-BD7HA: Provided (HDD => BD/DVD)	DZ-HS500A: Provided (HDD => DVD)
		DZ-BD70A: Not provided	DZ-GX5080A: ←
	Dubbing speed	HX: Approx. 2x HF: Approx. 2.5x HS: Approx. 4x SX/SF: Approx. 0.5x	XTRA: Approx. 1x FINE: Approx. 2x STD: Approx. 4x
	Dubbing mode	New, Date, All, Select	←
External input function		Not provided	DZ-HS500A: Provided (AV input)
			DZ-GX5080A: Not provided
Assist light function		Provided	←
EIS function		Provided	←
EVF display on/off function		Provided	←
LCD/EVF brightness setting function		Provided	←
16:9 record mode		Provided (*1)	Provided [Except for DVD-RW(VF mode)/ DVD-R using, STD mode]
Disc protect		Software disc-protect [BD-RE, DVD-RAM, DVD-RW(VR)]	Software disc-protect [DVD-RAM, DVD-RW(VR)]
HDD Protect (For DZ-BD7HA and DZ-HS500A)		Provided	←
Accessory Shoe		Provided	Not provided
AV/S input/output jack		Provided (output only)	DZ-HS500A: Provided (Except for S input)
			DZ-GX5080A: Provided (output only)
External microphone jack		Provided (a plug-in power type micro-phone only)	Not provided
PC connection terminal [USB standard]		Type mini-B [USB 2.0] (HDD: Read only)	←
HDMI terminal		Provided	Not provided
Component output terminal		Provided	Not provided
Menu button		Provided	←
Select button		Provided	DZ-HS500A: Provided (Photo/Select)
			DZ-GX5080A: Provided
Joystick		Provided	Provided (Cursor button)
Stop/Exit button		Provided	←
Photo button		Provided	DZ-HS500A: Provided (Photo/Select)
			DZ-GX5080A: Provided
Movie/Still select switch		Provided	Provided (with Power switch)
Power switch		Provided	←
Guide button		Provided	Provided (Quick menu)
Full auto button		Provided	←
BLC button		Provided	←
Exposure button		Provided	←
Focus button		Provided	←
Display button		Provided	←
Finalize button		Provided	←
Sleep/Restart button		Provided	←
Disc navigation button		Provided	←

Item		DZ-BD7HA/BD70A	DZ-HS500A/GX5080A
Dubbing button		DZ-BD7HA: Provided	DZ-HS500A: ←
		DZ-BD70A: No provided	DZ-GX5080A: ←
AC adapter/charger		DZ-ACS3	←
Battery pack	Accessory	DZ-BP14S (7.2V/680mA)	DZ-BP07PW (7.2V/680mA)
	Optional	DZ-BP14SW (7.2V/1360mA) DZ-BP7SW (7.2V/680mA)	←
Infrared remote control		Provided	Not provided
AV input/output cable or AV output cable		Pin 8 type (With Composite video/ Audio-L/Audio-R)	←
Provided software		■For Windows(*4) ImageMixer 3 HD Edition for BDCAM ■For Macintosh Not provided	■For Windows(*5) ImageMixer 3 ■For Macintosh(*6) ImageMixer 3 Mac Edition for DVDCAM
Provided disc cleaning cloth		Provided	←

*4: For Windows XP Home Edition/XP Professional SP2/Vista (Except for 64 bit edition)

*5: For Windows 2000 Professional SP3 or higher/XP Home Edition/XP Professional
See the following Websites to find out whether the provided software can be used on Windows Vista:
URL:http://www.pixela.co.jp/oem/hitachi/e/index.html
URL: http://dvdcam-pc.support.hitachi.ca/

*6: For Mac OS X (10.3.9/10.4.2-10.4.8)

2-5 Compatibility of Recorded DVD and Corresponding Recording Media

2-5-1 Compatibility of Recorded Discs

(1) DVD-RAM

1) DVD-RAM recorded or edited on DZ-BD7HA/BD70A:

The DVD-RAM can be recorded, edited and played (*1) on other Hitachi Hybrid/BD/DVD camcorders.

2) DVD-RAM recorded or edited on other Hitachi Hybrid/BD/DVD camcorders:

The DVD-RAM can be recorded, edited and played (*1) on DZ-BD7HA/BD70A.
However, scene memos recorded on the Disc Navigation function of DZ-MV100A cannot be played or edited on another model.

*1: If disc-protect is set, it must be released in order to record or edit on the disc. However, since the DZ-MV100A and DZ-MV200A series models use a different disc-protect method, disc-protect that was set on other models cannot be released on them.

(2) DVD-R

1) DVD-R recorded edited on DZ-BD7HA/BD70A:

The DVD-R can be played back on other Hitachi Hybrid/BD/DVD camcorders(*2) without being finalized. However, be sure not to record or finalize a DVD-R using other Hitachi Hybrid/BD/DVD camcorders: Doing so will make the DVD-R unusable.

Also, do not insert a DVD-R not finalized into a DVD recorder, etc. (*3): Inserting it may make the DVD-R unusable.

2) DVD-R recorded or edited on other Hitachi Hybrid/BD/DVD camcorders(*2):

A DVD-R not yet finalized can be played back on DZ-BD7HA/BD70A (*4), but cannot be recorded or finalized on DZ-BD7HA/BD70A.

*2: Only for models that conform to DVD-R. See "Table 2-5-1 List of Compatible Recording Media" for the models that conform.

*3: Except for DVD recorders, etc. whose instruction manuals state that "This model can play back a DVD-R recorded on Hitachi Hybrid/BD/DVD camcorders but not finalized".

*4: Loading a DVD-R/DVD-RW(VF mode) will automatically start the Disc Navigation function.

(3) DVD-RW (VR mode)

1) DVD-RW(VR) recorded or edited on DZ-BD7HA/BD70A:

The DVD-RW(VR) can be recorded, edited and played back on other Hitachi Hybrid/BD/DVD camcorders(*5).

2) DVD-RW(VR) recorded or edited on other Hitachi Hybrid/BD/DVD camcorders(*5):

The DVD-RW(VR) can be recorded, edited and played back on DZ-BD7HA/BD70A in the same way.

*5: Only for models that conform to DVD-RW. See "Table 2-5-1 List of Compatible Recording Media" for the models that conform.

(4) DVD-RW (VF mode)

1) DVD-RW(VF) recorded or edited on DZ-BD7HA/BD70A:

The DVD-RW(VF) can be played back on other Hitachi Hybrid/BD/DVD camcorders(*5) without being finalized. However, be sure not to record or finalize the DVD-RW(VF) using other Hitachi Hybrid/BD/DVD camcorders: Doing so will make the DVD-RW(VF) unusable.

Also, do not insert a DVD-RW not finalized into a DVD recorder, etc.(*6): Inserting it may make the DVD-RW unusable.

2) DVD-RW(VF) recorded or edited on other Hitachi Hybrid/BD/DVD camcorders(*5):

A DVD-RW(VF) not yet finalized can be played back on DZ-BD7HA/BD70A (*4), but cannot be recorded or finalized on DZ-BD7HA/BD70A.

*4: Loading a DVD-R/DVD-RW(VF mode) will automatically start the Disc Navigation function.

*5: Only for models that conform to DVD-RW. See "Table 2-5-1 List of Compatible Recording Media" for the models that conform.

*6: Except for DVD recorders, etc. whose instruction manuals state that "This model can play back a DVD-RW(VF mode) recorded on Hitachi Hybrid/BD/DVD camcorders but not finalized".

(5) +RW

The DZ-BD7HA/BD70A is not compatible with a +RW: No recording or playback is possible.

2-5-2 Corresponding Recording Media

HD: HD video
SD: SD video
ST: Still
Rp: Recording/Playback possible
Pb: Only playback possible
No: Non-compatibility

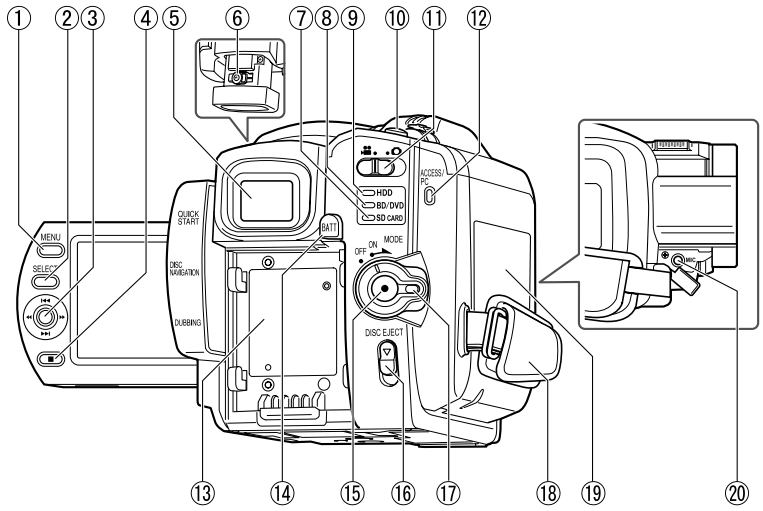
Table 2-5-1 List of Compatible Recording Media

<table>
<tr><th rowspan="2">Model</th><th rowspan="2">HDD</th><th>8 cm BD</th><th colspan="4">8 cm DVD</th><th colspan="2">Card</th></tr>
<tr><th>BD-RE/
BD-R</th><th>DVD-RAM</th><th>DVD-R</th><th>DVD-RW</th><th>+RW</th><th>SD
Memory
Card</th><th>Multi-
media
card</th></tr>
<tr><td>DZ-BD7HA</td><td>HD: Rp
SD: No
ST: No</td><td rowspan="2">HD: Rp
SD: No
ST: No</td><td rowspan="3">HD: No
SD: Rp
ST: Pb</td><td rowspan="11">HD: No
SD: Rp
ST: No</td><td rowspan="5">HD: No
SD: Rp
ST: No</td><td>No</td><td rowspan="10">HD: No
SD: No
ST: Rp</td><td rowspan="6">No</td></tr>
<tr><td>DZ-BD70A</td><td>No</td><td rowspan="4">No</td></tr>
<tr><td>DZ-HS500A
DZ-HS303A
DZ-HS300A</td><td>HD: No
SD: Rp
ST: No</td><td rowspan="8">HD: No
SD: Rp
ST: No</td></tr>
<tr><td>DZ-GX5080A
DZ-GX5020A
DZ-GX5000A
DZ-GX3300A
DZ-GX3200A
DZ-GX3100A
DZ-BX37A
DZ-BX35A</td><td rowspan="8">No</td><td rowspan="7">HD: No
SD: Rp
ST: Rp</td></tr>
<tr><td>DZ-GX20MA
DZ-MV780MA
DZ-MV750MA
DZ-BX31A</td><td rowspan="6">No</td><td rowspan="6">HD: No
SD: Rp
ST: Rp</td><td rowspan="5">No</td></tr>
<tr><td>DZ-GX20A
DZ-MV780A
DZ-MV730A</td><td rowspan="4">No</td></tr>
<tr><td>DZ-MV580A(*2)
DZ-MV550A(*2)</td><td rowspan="3">HD: No
SD: No
ST: Rp</td></tr>
<tr><td>DZ-MV380A(*2)
DZ-MV350A(*2)</td></tr>
<tr><td>DZ-MV270A(*1)
DZ-MV230A(*1)
DZ-MV200A(*1)</td><td rowspan="2">No</td><td rowspan="2">No</td></tr>
<tr><td>DZ-MV100A(*1)</td><td>No</td></tr>
</table>

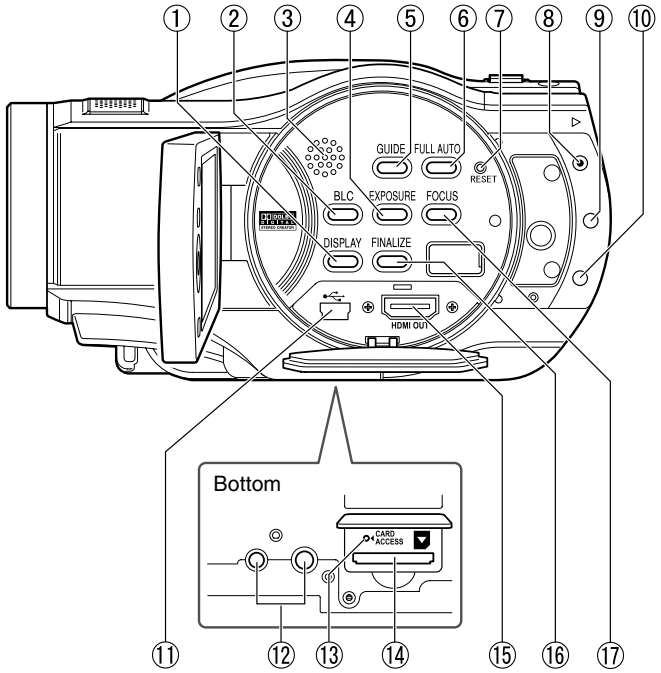
*1: An 8 cm DVD is inserted into the cartridge or caddy case for use on these models.

*2: An 8 cm DVD is inserted into the holder for use on these models.

2-6 Names of Parts



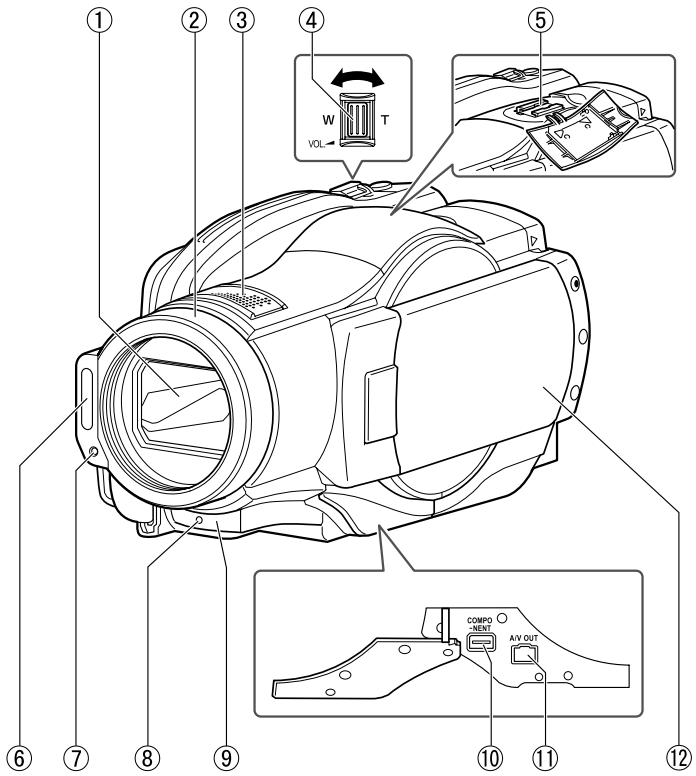
① MENU button
② SELECT button
③ Joystick
④ ■ (stop/cancel) button
⑤ Viewfinder
⑥ Diopter control
⑦ SD CARD indicator
⑧ BD/DVD indicator
⑨ HDD indicator (DZ-BD7HA)
⑩ PHOTO button
⑪ Movie/Stills switch
⑫ ACCESS/PC indicator
⑬ Battery platform
⑭ BATT (battery eject) switch
⑮ Record button
⑯ DISC EJECT switch
⑰ Power switch/Lock button
⑱ Hand strap
⑲ BD/DVD compartment
⑳ MIC jack



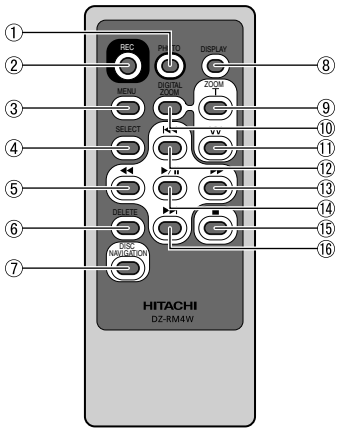
① DISPLAY button
② BLC button
③ Speaker
④ EXPOSURE button
⑤ GUIDE button
This button can help you choose a disc, connect the camcorder to your TV, and so on. The sections in the Instruction Manual for which this button can be used are indicated by a pop-up icon like the one below.

Use the GUIDE button for help !

⑥ FULL AUTO button
⑦ RESET button
⑧ QUICK START button
⑨ DISC NAVIGATION button
⑩ DUBBING button (DZ-BD7HA)
⑪ PC connection terminal
⑫ Tripod receptacle
⑬ CARD ACCESS indicator
⑭ SD card slot
⑮ HDMI OUT terminal
⑯ FINALIZE button
⑰ FOCUS button



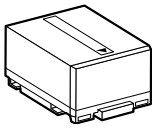
① Automatic lens cover
The lens cover automatically opens when the power is turned on, revealing the optical 10x zoom lens.
② Lens hood
③ Stereo microphone
Do not block the microphone with your hand during recording.
④ Zoom lever
⑤ Accessory shoe
⑥ Flash
⑦ Light receiving sensor
Used to control flash amount
Do not block the light receiving sensor with your hand when recording still pictures.
⑧ Recording indicator
⑨ Remote control receiver/Infrared sensor
⑩ COMPONENT output terminal
⑪ A/V OUT terminal
⑫ LCD monitor (color wide-screen)



① PHOTO button
② REC button
③ MENU button
④ SELECT button
⑤ ◀◀ (reversesearch)button
⑥ DELETE button
⑦ DISC NAVIGATION button
⑧ DISPLAY button
⑨ ZOOM T button
⑩ DIGITAL ZOOM button
⑪ ZOOM W button
⑫ ⏮ (reverse skip) button
⑬ ▶▶ (forward search) button
⑭ Confirmation button
⑮ ■ (stop/cancel) button
⑯ ⏭ (forward skip) button

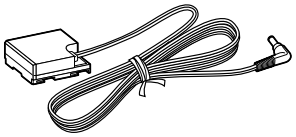
Accessories

Battery pack (DZ-BP14S)
Portable power supply for your new Hitachi Camcorder. Be sure to fully charge the battery before use.

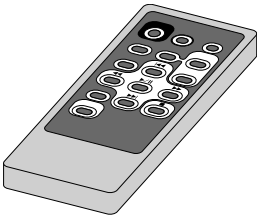


AC adapter/charger (DZ-ACS3)
Use to power the camcorder from an AC power outlet, and to charge the battery.

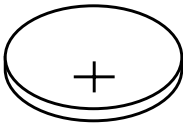
DC power cord
To power the camcorder from an AC outlet, use this cord to connect the AC adapter/ charger to the camcorder.



Remote control (DZ-RM4W)
Use to control the camcorder from a distance



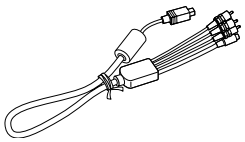
Lithium battery (CR2032)
To power the remote control.



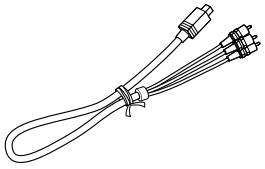
WARNING
Keep this battery away from children. If swallowed, consult a physician immediately for emergency treatment.

Power cable
Connects the AC adapter/ charger to the AC outlet.

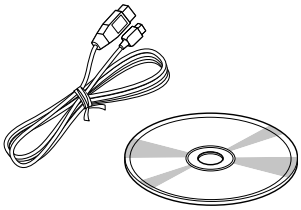
AV/S cable
Use this cable to view images from the camcorder on a TV. Or output the images and sound to another video recording device.



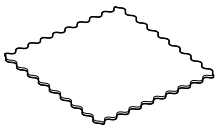
Component cable
Use this cable when a component terminal is equippedon your TV. Use the AV/S cable for audio output



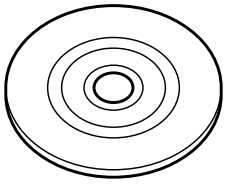
Software CD-ROM and PC connection cable
Install the software on the CD-ROM onto your PC, then connect the camcorder to the PC using the PC connection cable.



Disc cleaning cloth
You can use this cloth to clean your discs.



8 cm BD-RE single sided disc
Use to record the movies on.



2-7 List of Abbreviations and Terms

Index	Abbreviation/Term	Explanation
A	AC3	See Dolby AC3.
	ATA	AT Attachment interface: The name of HDD connection standard.
	AVCHD	Advanced Video Codec High Definition: This format is for recording high quality images on 8 cm DVD, SDHC, etc.
B	BD	Blu-ray Disc: The format is established by BDA. Data is written and read to/from this disc using blue-violet laser. The recording capacity is at least five times that of a DVD.
	BDA	Blu-ray Disc Association: This industrial group is establishing the format specifications for Blu-ray Disc, promulgating and promoting them. (BDA is different from the DVD Forum and DVD+RW Alliance.)
	BDAV	One video recording/playback application format adapted to BD: It corresponds to the DVD video recording format for DVDs.
	BDMV	One video recording/playback application format adapted to BD: It corresponds to the DVD Video format for DVDs.
	BD-FS	Blu-ray Disc File System: To enhance response, data is divided and recorded in the "real-time data area" and "gathered file area".
	BD-R	Blu-ray Disc Recordable: This BD application format allows one-time recording (write-once).
	BD-RE	Blu-ray Disc Rewritable: This BD application format allows rewriting up to 1000 times.
	BD-ROM	One BD application format. A BD-ROM is a read-only disc on which data and high-quality video/audio are recorded.
C	CGMS	Copy Generation Management System: This is the copy control technology used by video devices. Referred to as CGMS-A for analog technology, and CGMS-D for digital technology.
	Component terminal	Application standard for analog video signal input/output terminals, which transfer the video signal by dividing it into luminance and color-difference (cr/cb) and sync signals.
	CPRM	Content Protection for Recordable Media: A copyright protection function for recording media (DVD-R/DVD-RW/DVD-RAM/SD memory card, etc.).
	CSP IC	Chip Scale Package IC or Chip Size Package IC: This IC was made compact by arranging pins under the package.
D	DCF	Design rule for Camera File system standard: This camera file system standard.
	Dolby AC3	Audio coding format developed by Dolby Laboratories in U.S, also simply referred as AC3 format: Supports 5-channel full-range sound and one channel for sub-woofer sound playback.
	Dolby Digital	See Dolby AC3.
	DPOF	Digital Print Order Format: DPOF allows user to record print information along with photos on storage media to facilitate printing of photos.
	dts (DTS)	Digital Theater System: The audio digital compression recording/playback system developed by DTS, Inc., which is used for audio tracks of movies and DVD-Video.
	DVD	Digital Versatile Disc. A huge amount of digital data for video (movie) and audio can be recorded on this disc, whose size is the same as CD.
	DVD Forum	An industrial group that is establishing, promulgating and promoting the DVD format specifications, and controlling the licenses. (This group differs from the DVD+RW Alliance and BDA).
	DVD Video Format	Video recording/playback standard that applies to DVD-Video, DVD-R and DVD-RW

Index	Abbreviation/Term	Explanation
D	DVD Video Recording Format	Video recording/playback standard that applies to DVD-RAM and DVD-RW: This allows versatile editing functions, differing from the DVD Video Format.
	DVD+RW Alliance	An industrial group that has developed +R, +RW and DVD+VR, and is establishing, promulgating and promoting the format specifications. (This group differs from the DVD Forum and BDA).
	DVD+RW Video Format	Video recording/playback format for +RW was developed by DVD industry organization "DVD+RW Alliance", which is different from the DVD Forum.
	DVD-Audio	One type of DVD standard disc, on which high-quality audio can be recorded
	DVD-R / DVD-R DL	A DVD application format. One-time recording (write-once) disc: DL stands for Double Layer (2-layer structure). The storage capacity of DL is 1.8 times that of the 1-layer-structure disc.
	DVD-RAM	One type of DVD standard disc, to which writing up to 100,000 times is possible
	DVD-ROM	One type of DVD standard disc, to which data for computer can be recorded
	DVD-RW	One type of DVD standard disc, to which writing up to 1000 times is possible
	DVD-Video	One type of DVD standard disc, on which high-quality video and audio can be recorded
	DVD-VR Format	See DVD Video Recording Format.
E	Exif	Exchangeable image file format. File format used for recording photos on digital cameras.
F	FireWire	See IEEE1394.
	FNR	Frame Noise Reducer: This function or circuit automatically recognizes noise that randomly occurs between frames and removes it.
	Full HD	See HDTV / HD.
H	HD DVD	One type of DVD to and from which data is written and read using blue-violet laser. The DVD Forum is establishing, promulgating and promoting the format specifications.
	HDMI	Digital video/audio input/output interface standard for consumer electronics and AV devices. A single HDMI cable allows sending and receiving of video, audio and control signals.
	HDTV / HD	Stands for High-Definition Television. This refers to high-definition TV and also its video standard: Also referred to as HD or Hi-Vision. The high-definition standard with resolution of 1920 x 1080 is sometimes referred to as full HD.
	HDV	High-Definition Video: This format is for recording HD on DV/MiniDV cassette tapes.
I	IEEE1394	Also referred to as FireWire or i-LINK: Standard for serial interface that connects PC and peripheral devices
	Interlaced CCD	This CCD scans one image twice (scans roughly once and interpolates between first scanning lines the second time) and interlaces the images obtained by scanning twice to create a one-image signal.
	i-LINK	See IEEE1394.
J	JPEG	Joint Photographic Expert Group: International standard format for compressing still images
L	LCD	Liquid Crystal Display. LCD formats include STN and TFT.
	LPCM	Linear Pulse Code Modulation. Also referred to as linear PCM. LPCM is a format that digitizes analog audio data during recording and converts it to analog data during playback.
M	microSD Memory Card	This micro-type SD memory card is 15 mm long, 11 mm wide and 1 mm thick, weighing less than 1 g. If an adapter is attached, it can be also be used as an SD memory card/miniSD memory card

Index	Abbreviation/Term	Explanation
M	miniSD Memory Card	This mini-type SD memory card is 21.5 mm long, 20 mm wide and 1.4 mm thick, weighing approx. 1 g. If an adapter is attached, it can be also be used as an SD memory card.
	MMC	See MultiMediaCard.
	MP3	MPEG Audio Layer-3: One type of audio compression standard specified by MPEG.
	MPEG	Motion Picture Experts Group: Standard related to compression of digital video and audio. MPEG2 is a higher standard of MPEG and is applied to video (movie) requiring higher quality.
	MPEG Audio Layer 2	One of three audio compression standards (layers 1-3) defined by MPEG
	MultiMediaCard	Also referred to as MMC. Compact memory card, 32 mm long × 24 mm wide × 1.4 mm thick
P	PCM	Pulse Code Modulation: One method of converting an analog signal, such as audio, to pulse group: An analog signal is sampled and quantized to an integral value of specified bit number.
R	Region Codes	These codes, used for DVD-Video and BD, restrict the playable areas.
S	SCSI	Small Computer System Interface: A standard for connecting computer and peripheral devices. The number, First, Ultra, Wide, etc., prefixed or suffixed to SCSI indicates the data transfer rate and connector specifications.
	SDHC	Standard of larger storage SD memory card, which has a capacity exceeding 2 GB (over 4 GB), though the size is the same as that of conventional memory cards.
	SDMI	Secure Digital Music Initiative: This conference was established by hardware makers, the Recording Industry Association of America (RIAA) and music industry companies, to protect copyrights of musical compositions.
	SDTV / SD	Stands for Standard Definition Television: Conventional TV format. These terms are used when comparing with HDTV/HD.
	SD Memory Card	Formally named Secure Digital Memory Card. This compact memory card, 32 mm long × 24 mm wide × 2.1 mm thick, is equipped with an advanced copyright protection function.
	SecureMMC	See Secure MultiMediaCard.
	Secure MultiMediaCard	Also referred to as SecureMMC. This compact memory card has multimedia card specifications, to which an advanced copyright protection function is added.
	Software Disc Protect	This function writes the protect information to DVD-RAM disc to prevent accidental erasure. Software Disc-Protect is included in DVD-RAM disc specifications defined by DVD Forum.
	STN LCD	Super-Twisted Nematic Liquid Crystal Display: This type of color LCD is inferior to TFT LCD in coloring, view angle, etc.
T	TFT LCD	Thin Film Transistor Liquid Crystal Display: This type of color LCD features clear display, high contrast, wide view angle, etc.
U	UDF	Universal Disc Format, which is a file format of recordable disc defined by OSTA. The revision 2.01 UDF is used on DVD video camera/recorder.
	USB	Universal Serial Bus: Standard of serial interface that connects PC and peripheral devices. Two versions - USB1.1 and USB2.0, with different data transfer rates - exist at present.
V	VBR	Stands for Variable Bit Rate: This format of coding audio and video varies the amount of data depending on the subject image.
Etc.	+R / +R DL	Digital discs whose specifications are established and promulgated by “DVD+RW Alliance”, which is an industrial group different from “DVD Forum”. +R is recordable, and +RW is rewritable. They are referred to as DVD+R and DVD+RW. DL stands for Double Layer (2-layer structure). The storage capacity of DL is 1.8 times that of the 1-layer-structure disc.
	+RW	

3 Description of Operation

3-1 Description of Structure

(1) Differences in structure between DZ-BD7HA and DZ-BD70A

Although the DZ-BD7HA and DZ-BD70A resemble each other, the shapes of the following components differ greatly, depending on whether the HDD is mounted or not:

a) Side case R (including presence/absence of HDD cover)
b) Side case L (presence/absence of DUBBING button)
c) Rear case (including presence/absence of HDD indicator

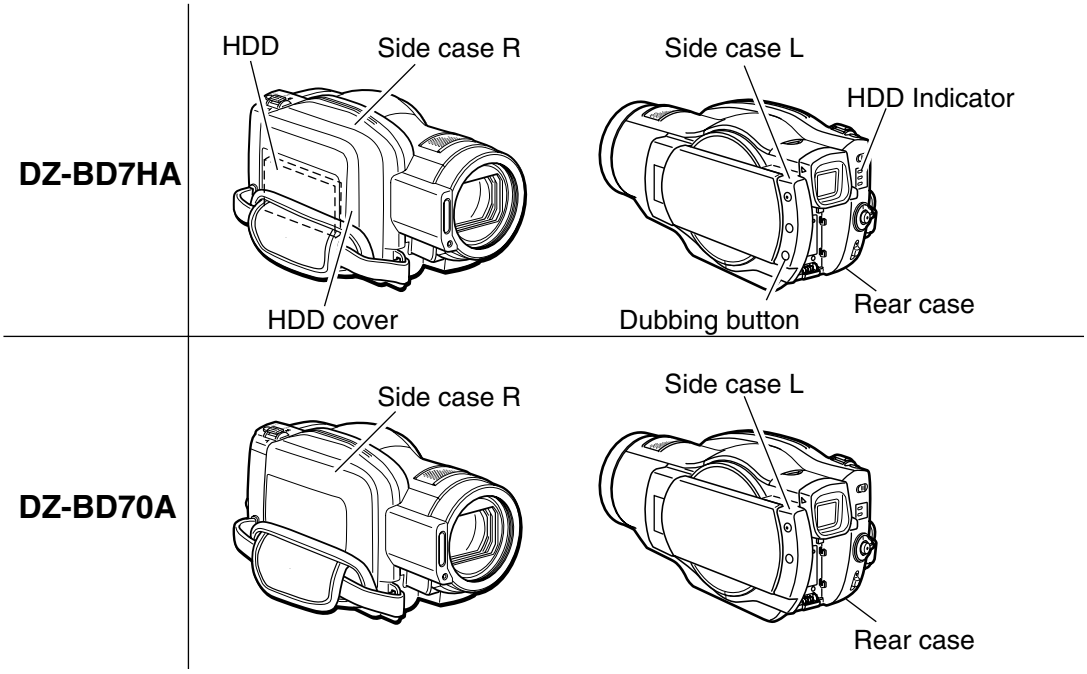


Fig 3-1-1 Differences in structure between DZ-BD7HA and DZ-BD70A

(2) Major unit/circuit board

(a) BD drive unit
(b) EVF unit
(c) Flash unit
(d) HDD unit (DZ-BD7HA only)
(e) LCD unit
(f) Lens unit
(g) 5MCMOS circuit board:

Relays the CMOS image sensor to the MAN circuit board.

On the parts list, this circuit board is registered as “Sensor Assy”, and a CMOS image sensor is mounted on the board.

(h) AEL circuit board:

Supplies the analog video/audio signals, etc. to EVF unit, LCD unit and various output terminals, etc. This board also incorporates an SD memory card slot.

(i) AVS circuit board:

Incorporates the AV output terminal.

(j) EXL circuit board:

Incorporates the operation buttons on the left side (FULL AUTO, FOCUS, etc.), backup battery, and terminals for adjustment. This board also relays the AEL circuit board to the buttons on side case L and the LCD unit.

(k) FRT circuit board:

Incorporates external microphone jack, infrared sensor for remote control and infrared sensor for white balance.

(l) GYRO circuit board:

Incorporates the gyro sensors for camera shake compensation.

(m) HDF circuit board (DZ-BD7HA only):

This file-like board connects the HDD unit and MAN circuit board.

(n) LAF circuit board:

Connects the AEL and EXL circuit boards.

(o) MAN circuit board:

Incorporates the entire Hybrid/BD camcorder control circuit, video/audio signal processing circuit, power supply circuit, etc.

(p) MIC circuit board:

Incorporates the amp circuit of built-in microphone.

(q) SFF circuit board:

Connects the FRT circuit board and flash unit.

(r) USB circuit board:

Incorporates the HDMI, PC connection, and component video output terminals.

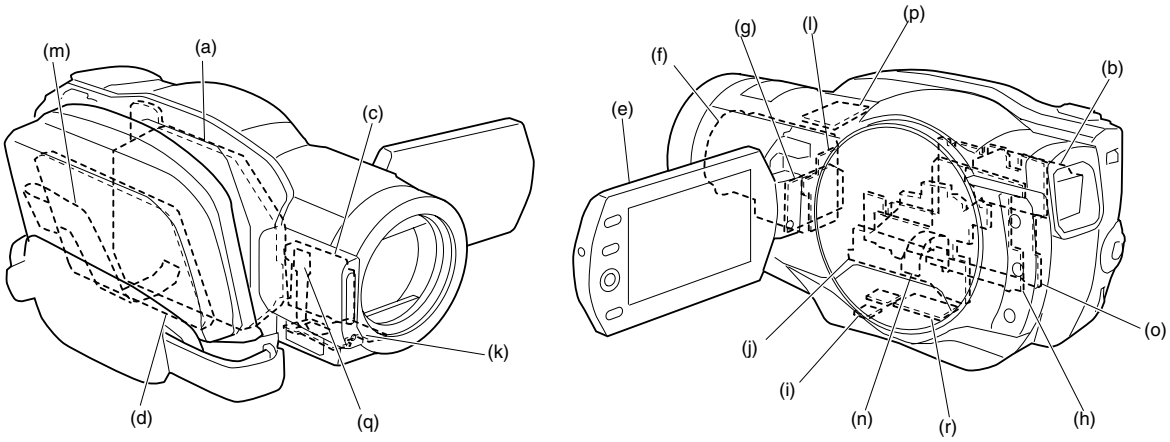


Fig 3-1-2 Position of the major unit/circuit board

3-2 Description of Newly Adapted Technology

3-2-1 Blu-ray(*1) Disc (BD)

(1) Overview of BD and Specifications

A Blu-ray disc (BD) is an optical disc whose format has been established by the Blue-ray Disc Association (BDA): Data is written and read using blue-purple laser.

A BD achieves a shorter track pitch by using a blue-purple laser with shorter wavelength and enhancing the NA value (*2) , as shown in the table below, enabling the storage capacity more than five times that of same-size DVD (single-sided, one layer).

Table 3-2-1 Comparison of Specifications between BD and DVD

Item	BD (single-sided, 1 layer)		DVD (single-sided, 1 layer)	
Disc diameter	12cm	8cm	12cm	8cm
Storage capacity (GB)	25(*3)	7.5	4.7	1.46
Laser wavelength (nm)	405		650	
Lens NA value (*2)	0.85		0.6	
Track pitch (μm)	0.32		0.74	
Thickness of disc (mm)	1.2		1.2	
Thickness of light transmission protective layer (mm)	0.1		0.6	

*1: The logo “Blu-ray Disc” has no “e” following “Blu”.

*2: NA stands for numerical aperture, which is a value that shows how a lens focuses light. The higher the NA value, the shorter the focal distance will be, so the thickness of light transmission protective layer can be as small as 0.1 mm.

*3: The storage capacity on BD varies depending on the format and version. See Table 3-3-2 for details.

(2) Physical formats of discs

Table 3-2-2 List of Physical Formats of Discs

Format	Overview	Major version and characteristics	
BD-RE	Rewritable up to 10,000 times	Ver. 1.0	Disc in cartridge
			File format: BD-FS (*4)
			Storage capacity: 23.3 GB (12 cm, single-sided, 1 layer)
		Ver. 2.1	Bare disc
			File format: UDF2.5
			Storage capacity: 25 GB (12 cm, single-sided, 1 layer)
BD-R	Recordable only once	Ver. 1.1	Bare disc
			File format: UDF2.6
			Storage capacity: 25 GB (12 cm, single-sided, 1 layer)
BD-ROM	Playback (read) only	Ver. 1.0	Bare disc
			File format: UDF2.5
			Storage capacity: 25 GB (12 cm, single-sided, 1 layer)

*4: BD-FS stands for Blu-ray disc file system: This recording format will improve the playback response. The BD-FS format divides the disc recording area between "real-time data area" - where the stream of video/audio, etc. is recorded - and the "gathered file area" - where the stream control database is recorded, which improves the response.

(3) Video recording/playback format

The table below shows the video recording/playback system that the BD format supports, and the compatibility with DZ-BD7HA/BD70A. The DZ-BD7HA/BD70A cannot record a photo on a BD.

Table 3-2-3 Formats of Video Recording/Playback on BD

Format	Description	Compatibility with DZ-BD7HA/BD70A
BD-RE Ver. 3.0/ BD-R Ver. 2.0	Format corresponding to the DVD-Video format in DVD formats	Recording/playback possible
BDAV (BD-AV)	Format corresponding to the DVD-Video Recording format in DVD formats	Incompatible

(4) Audio recording/playback system

The table below shows the audio recording/playback system that the BD format supports, and the compatibility with DZ-BD7HA/BD70A.

Table 3-2-4 Formats of Audio Recording/Playback on BD

Format	Compatibility with DZ-BD7HA/BD70A	Remarks
Dolby Digital	Recording/playback possible	
dts (DTS)	Incompatible	
Linear PCM	Only playback possible	
Dolby Digital Plus	Incompatible	BD option formats
Dolby TrueHD		
DTS-HD		

3-2-2 1.8-inch HDD for DZ-BD7HA

The DZ-BD7HA built-in HDD is a 1.8-inch HDD with 30 GB capacity produced by Samsung Electronics. It is not compatible with the 1.8-inch HDD mounted in DZ-HS500A.

(1) Specifications

Table 3-2-5 HDD Specifications

Item		Specification
Interface		Ultra ATA66 compatible
Storage capacity		30 GB
Number of disks		1
Number of heads		1
Disc rotation speed		3600 rpm/minute
Average seek time		15 ms
Data transfer rate (max.)		100 Mb/s
Data buffer capacity		192 KB
Noise	During idling (max.)	1.8 bels
	During seek (max)	2.4 bels
Power voltage		+3.3 V
Power consumption (max.: at startup)		1.1 W
Impact (applying time)	During operation	600 G (2 ms)
	During non-operation	1500 G (1 ms)
External dimensions (W×D×H)		Approx. 54 x 71 x 5 mm
Weight		Approx. 48 g

(2) Recording/playback format

Table 3-2-6 HDD Recording/Playback Format

Signal		Recording/playback format
Video	Movie	Equivalent BD-RE Ver. 3.0
	Photo	Cannot be recorded
Audio		Dolby Digital

3-2-3 High-Definition (HD) Recording

High-Definition is a video format for high-definition television (HDTV) shown in the table below: It is also abbreviated to HD.

The high-definition format with the resolution of 1920 x 1080 or higher is known as "full high-definition (full HD)" (*5).

The DZ-BD7HA and DZ-BD70A are compatible with 1080i (resolution 1920 x 1080 and 1440 x 1080) shown in the table below, which means they can record videos on HDD (DZ-BD7HA only) and BD in full high definition.

Table 3-2-7 High-Definition Video Formats

Format	1080i		1080p		720p	
Resolution	1920×1080	1440×1080	1920×1080	1440×1080	1280×720	960×720
Scanning system	Interlaced		Progressive		Progressive	
Number of effective scanning lines	1080		1080		720	
Total number of scanning lines	1125		1125		750	
Frame rate	30 frames/s, 60 fields/s		60 frames/s		60 frames/s	
Compatibility on DZ-BD7HA/BD70A	Recording/playback possible		Incompatible		Incompatible	
Remarks	Full HD		Full HD			
	D terminal: D3 and after		D terminal: D5		D terminal: D4 and after	
	Also known as 1125i		Also known as 1125p		Also known as 750p	

*5: The definition of full high-definition may vary.

3-2-4 CMOS sensor

The image sensors of camcorders can roughly be divided into CMOS (complementary metal oxide semiconductor) and CCD (charge coupled device).
The table below compares the major features of CMOS and CCD sensors:

Table 3-2-8 CMOS Sensor and CCD Sensor

Item	CMOS sensor	CCD sensor
Smears (when a subject with vehicle headlight, etc. is shot, a vertical light band will occur above and below the light source)	Does not occur	Occurs
Output signal	Digital (*6)	Analog
Focusing rapidly moving subject	Not good	Good
Pixel data readout speed	Speedup is possible. Suitable for greater increases in pixel numbers.	Speedup is limited. Not suitable for large increases in pixel numbers.
Miscellaneous	Peripheral circuits can easily be incorporated.	Incorporating peripheral circuits is difficult.

*6: The CMOS sensor in DZ-BD7HA/BD70A outputs digital signals. Some CMOS sensors in other products may output analog signals.

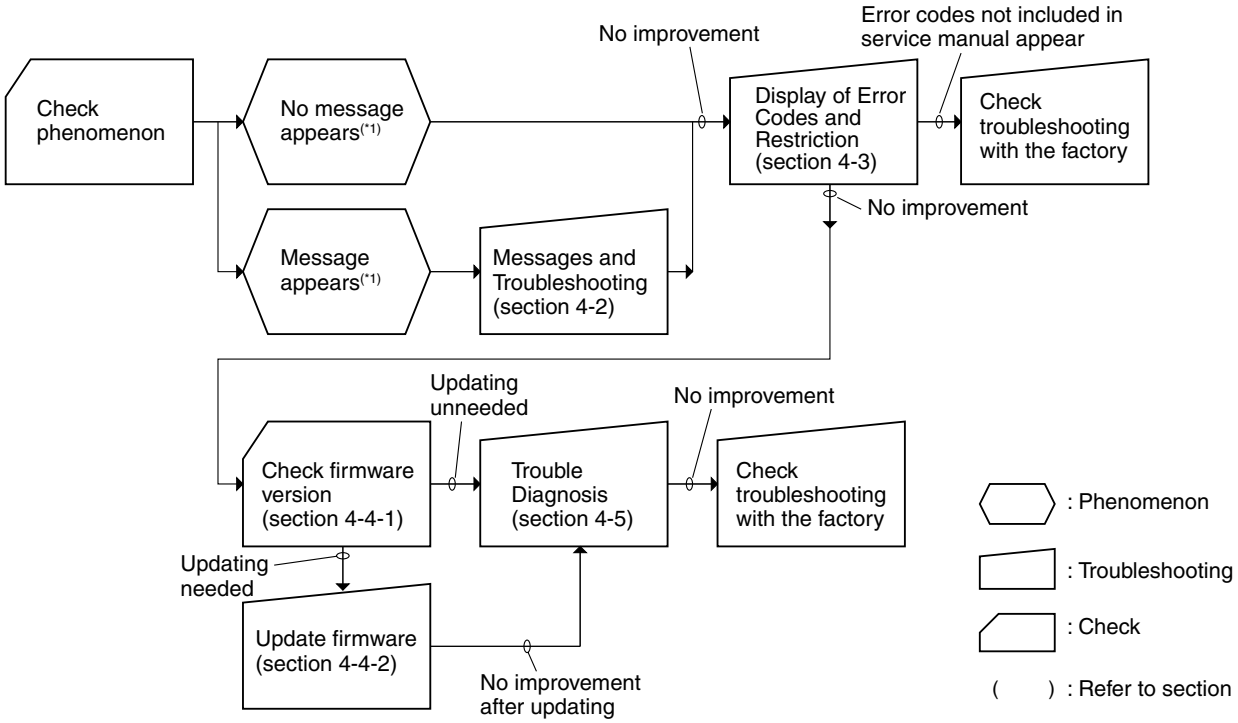
4 Troubleshooting

4-1 Procedure for Troubleshooting

Perform troubleshooting in the order shown in Fig. 4-1-1.

Note:

1) Before troubleshooting or servicing, be sure to obtain customer approval for the following:
   a) The recorded contents on BD/DVD/HDD may be lost depending on the details and situation of fault (defect).
   b) The date/time and various settings, including video recording mode, designated by customer after purchase, may be reset to the defaults before purchase (factory settings).
2) Perform "4-7-2 System reset procedure" after repair is completed: Note that system reset will erase all error codes that will be necessary for troubleshooting.
3) Take notes of settings on received product in the Memo columns, referring to "Table 4-7-1 List of items to be reset": These notes will be necessary not only for reset, but for checking any defects that occur under the particular setting conditions.



*1: Messages and error codes will appear on LCD monitor or in viewfinder.

Fig. 4-1-1

4-2 Messages and Troubleshooting

Some messages may appear on the LCD screen or in the viewfinder during operation. If a message appears, check the following, and then perform the appropriate action, according to the message content:

1) Is the disc bottom/surface reversed when using a single-sided BD/DVD?
   If so, reload the disc properly.
2) Is there any condensation on the lens or in the BD drive unit, HDD of camcorder?
   Condensation will occur when the camcorder is moved from a cold place to a warm place, e.g. If condensation occurs, set the power switch to "OFF" with the BD/DVD loaded, and then leave the camcorder in a dry place until condensation disappears (for 1-2 or more hours).

Message	Cause/condition for message to appear	Troubleshooting
All scenes are already dubbed. Please use other Dub Mode.	Appears if "New" dubbing mode is chosen and executed with all scenes on HDD dubbed once.	Turn off the dubbed marks on the scenes to be dubbed, or use another dubbing mode.
Cannot combine scene.	Appears if an attempt is made to combine unconnected scenes: The specifications state that combining of only multiple scenes is possible.	Stop trying to combine scenes, or create a play list containing the scenes to be combined, and combine them on the play list.
Cannot combine scenes with different recording dates. Create Playlist first, and then combine scenes.	Appears if an attempt is made to combine scenes with different recording dates.	When combining them, create a playlist first, and then combine on the playlist.
Cannot combine. Select multiple scenes.	Appears when combining one scene was attempted.	Select multiple scenes and then combine them.
Cannot delete scene. Delete other scenes first and then retry	Appears if an attempt is made to delete a divided scene when the number of scenes has reached the registrable limit. [Refer to *1 and *3 on page 4-11.]	To delete the scene, recombine the divided scenes, and then delete the target scene. Or delete other scenes and then delete the target scene.
Cannot divide. Unselect multiple scenes	Appears if an attempt was made to select multiple scenes and divide. It is specified that the multiple scenes cannot be divided simultaneously.	Divide one scene at a time.
Cannot execute. Change display category to All.	Appears when combining or moving scenes was instructed with "Category: Movie or Still" specified.	Specify "Category: All", and then operate the camcorder again.
Cannot finalize disc in HDD mode. Please finalize disc in BD/DVD mode . [DZ-BD7HA only]	Appears when the FINALIZE button was pressed in the HDD mode when the HDD indicator is lit. It is specified that finalization is possible in the BD/DVD mode when the BD/DVD indicator is lit.	Turn the power switch to the BD/DVD mode, and then press the FINALIZE button.
Cannot read disc. Check dirt/crack/both-sides contrary/inserted correctly.	Appears when reading or writing any recorded files cannot be done due to dirt on BD/DVD.	Refer to "4-3-5 Cleaning BD/DVD and optical pickup" and clean the BD/DVD. Or replace the BD/DVD.
	Appears when a warped or distorted BD/DVD, or a logically damaged disc, whose initialization was previously interrupted, is loaded.	Replace the BD/DVD.

Message	Cause/condition for message to appear	Troubleshooting
Cannot record video. Set Movie/Still image switch to "Movie".	Appears if the record button was pressed when the Movie/Still switch was set to "Still".	When recording a movie, set the Movie/Still switch to "Movie" and record it on a BD/DVD or the HDD.
Cannot select any more scenes	Appears if the number of scenes has exceeded the limit during selection of scenes. [Refer to *1 on page 4-11.]	Keep selection of scenes within the limit.
Cannot sleep mode	Appears when the camcorder cannot enter the SLEEP mode because it is set to the recording pause status for any of the following reasons: ・ No BD/DVD or SD memory card is loaded. ・ The loaded BD/DVD or SD memory card has a little free space. ・ The HDD or BD/DVD is write-protected.	・ Load an SD memory card. ・ Replace it with a BD/DVD or SD memory card that has sufficient free space, or remove unnecessary scenes. ・ Release the protection from the HDD or BD/DVD.
Cannot take still image. Set Movie/Still image switch to "Still image".	Appears if the PHOTO button was pressed when the Movie/Still switch was set to "Movie".	When recording a still, set the Movie/Still switch to "Still" and record it on an SD memory card.
Card almost full	Appears when the remaining number of recordable stills has reached less than 10 during recording.	Prepare another card, or delete unnecessary stills.
Card error has occurred.	Appears when the card cannot be recognized because its terminals are dirty.	Use a dry cloth to clean the card terminals.
	Also appears when data other than photos is recorded on card.	Replace the card.
Card error has occurred. Format the card now? YES NO	Appears when a card initialized on PC, etc., or a card whose initialization was interrupted before, is loaded.	Choose "YES" and designate it to initialize the card (deleting all recorded data).
Card error has occurred. Formatting is not complete.	Appears when a damaged card is initialized.	Replace the card.
Card error has occurred. Keep card inside & restart.	Appears when an error occurred during editing of still files.	Set the power switch to "OFF", and after several seconds, set it to “SD”.
Card full.	Appears when the recording capacity of card has reached the limit during recording.	Replace the card, or delete unnecessary stills.
	Appears when a card whose remaining recording capacity is small, and on which no still can be recorded, is loaded.	Replace the card, or delete unnecessary stills.
	Appears if the recordable capacity on card has reached the limit while Disc Navigation is being operated.	Replace the card, or delete unnecessary stills.
Card is not formatted. Format the card now? YES NO	Appears when an unformatted card or a card formatted on PC was loaded.	Choose “YES” and designate it when formatting card (deleting all recorded data).
Check card	Appears if a card unusable on DZ-BD7HA/BD70A was inserted.	Insert a card usable on DZ-BD7HA/BD70A.

Message	Cause/condition for message to appear	Troubleshooting
Check disc	Appears when disc that cannot be used on the DZ-BD7HA/BD70A, or logically damaged BD/DVD (warped or distorted), was loaded.	Check the type of BD/DVD, and for scratch or distortion on BD/DVD: If the BD/DVD is scratched or distorted, replace it.
	If the type of disc is acceptable, and there is no scratch or distortion, the BD/DVD may be defective.	Replace the BD/DVD.
Check HDD	Appears when a fault in HDD is detected.	If HDD protection has been engaged, release it. If HDD protection has not been engaged, replace the HDD.
Control Information Error.	Also appears when reading or writing from/to recorded file cannot be performed because the BD/DVD is dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Appears when mismatch between recorded scene and scene information occurs. Such a mismatch occurs when editing is performed near the limit of disc storage capacity, or when the control information file is operated using a device other than the DZ-BD7HA/BD70A.	Update the control information. (Start Disc Navigation, press the MENU button, and then execute “Update Control Info.” in the “BD/DVD Setting” menu.
Disc almost full	Appears when the movie recordable capacity on the BD/DVD is less than one minute.	Delete unnecessary scenes. Or replace the BD/DVD.
Disc error has occurred.	Also appears when reading or writing from/to recorded file cannot be performed be cause the BD/DVD is dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Appears when the disc has been edited on a device other than the DZ-BD7HA/BD70A, and mismatch has occurred in recorded data.	Format the BD/DVD (deleting all recorded data), or replace the BD/DVD.
Disc error has occurred. Finalizing is not complete.	Appears when the BD/DVD could not be finalized because it was dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Appears if accident, such as power off, has occurred during finalizing.	Turn the power switch to "OFF", disconnect the AC adapter/charger and then reconnect it, turn the power switch to the "BD/DVD" mode, and then perform finalizing again. Or remove the BD/DVD once, insert it again, and then finalize it again.
	If the message still appears even when the BD/DVD has been cleaned and finalized again and again, the BD/DVD may be defective.	Replace the BD/DVD.

Message	Cause/condition for message to appear	Troubleshooting
Disc error has occurred. Format the disc now? YES NO	Appears when reading or writing from/to recorded file cannot be performed because the BD/DVD is dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Appears when a DVD-RAM/DVD-RW initialized on PC, etc., or a card whose initialization was suspended before, is loaded.	Choose “YES” and designate it to initialize the DVD-RAM/DVD-RW (deleting all recorded data).
Disc error has occurred. Formatting is not complete.	Appears when the BD/DVD could not be normally formatted because it was dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Also appears when a warped or distorted BD/DVD was loaded, or a logically damaged BD/DVD whose formatting was suspended is loaded.	Replace the BD/DVD.
Disc error has occurred. Keep disc inside & restart.	Appears if a problem has occurred during editing of movie file.	Terminate the disc navigation function, turn the power switch to "OFF" with the BD/DVD loaded: Disconnect the AC adapter/charger and then reconnect it, and turn the power switch to the "BD/DVD" mode. (The camcorder will automatically repair movie file.)
Disc error has occurred. Turn the power switch off once and then set it to "BD/DVD".	Appears when BD/DVD error occurred during dubbing, and a file could not be written.	Turn the power switch to "OFF", Disconnect the AC adapter/charger and then reconnect it, and turn the power switch to the "BD/DVD" mode. (The camcorder will automatically repair the movie file.)
Disc error has occurred. Unfinalizing is not complete.	Appears when the BD/DVD could not be normally formatted because it was dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Appears when an accident, such as power off, occurred during unfinalizing.	Turn the power switch to "OFF", disconnect the AC adapter/charger and then reconnect it, and turn the power switch to the "BD/DVD" mode. Reinsert the BD/DVD, and then unfinalize it.
	If no recovery is made even when the BD/DVD is cleaned or unfinalized again, the BD/DVD may be defective.	Replace the BD/DVD.
Disc has no image.	Appears when playback or editing is attempted using the Disc Navigation function with no scene recorded on BD/DVD.	Operate the camcorder after the message disappears.
Disc has no Play List.	Appears if switching of play list is selected with no play list registered.	Operate the camcorder after the message disappears.

Message	Cause/condition for message to appear	Troubleshooting
Disc includes protected scenes. Delete scenes? YES NO	Appears if the loaded DVD-RAM/DVD-RW(VR) has a program (scene) that is write-protected by the software write-protect function, which is effective in program units. Although the camcorder is equipped with a software disc-protect function that is effective for disc units, it does not comply with software write-protect for program units. The DVD Forum defines two types of software protect for DVD-RAM/DVD-RW(VR): disc units and program units.	Release the write-protect using the device that has the software write-protect function for program units, or choose "YES" and designate it to delete the scenes.
Disc is full. Cannot add control info.	Appears if the number of scenes on play list exceeds the upper limit while control information is being added. [Refer to *1 page 4-11]	Delete any unnecessary scenes, or combine several scenes, and then operate the camcorder.
Disc is not formatted. Format the Disc now? YES NO (When using a DVD-RW: If you select "YES" with the above message, the message shown below will appear.) Disc format. Select record format. VR mode VF mode	Appears when a brand-new BD-RE/ BD-R/DVD-RW was loaded.	When recording on the camcorder, choose "YES/VR Mode/VF Mode" and designate it.
	Appears when reading or writing from/to recorded file cannot be performed because the DVD-RAM is dirty.	Refer to "4-3-5 Cleaning BD/DVD and optical pickup" and clean the BD/DVD. Or replace the BD/DVD.
	May appear when a BD/DVD formatted and recorded on a device other than camcorders is loaded.	Use a PC, etc. to check the contents on BD/DVD.
	Appears when an unformatted BD-RE/BD-R/DVD-RAM/DVD-RW or one initialized (other UDF2.0) on PC is loaded.	When initializing it (deleting all recorded data), choose "YES" and designate it.
	Also appears if user rejects partial repair or total repair of video file.	Choose "NO" and designate partial repair or total repair. When initializing it (deleting all recorded data), choose "YES" and designate it.
Disc must be finalized before it can be played on another device.	Appears if a non-finalized BD-R/ DVD-RW(VF)/DVD-R is removed.	Finalize the BD-R/DVD-RW(VF)/ DVD-R before playing it back on another BD/DVD device.
Drive overheat. Please retry later.	Appears when the temperature inside the camcorder, or the temperature of BD/DVD, is too high, and normal operation cannot be executed.	Set the power switch to "OFF" with the BD/DVD loaded, and then leave the camcorder in a well-ventilated place until the inside temperature decreases.
Dubbing is not complete	Appears when dubbing has failed.	Retry dubbing. Replace the BD/DVD.
End of card	Appears when the recording capacity of card has reached the limit during recording.	Replace the card, or delete unnecessary stills.

Message	Cause/condition for message to appear	Troubleshooting
Error occurred. Please replace disc or format disc.	Appears when reading or writing from/ to recorded file cannot be performed because the DVD is dirty.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
	Appears if repair has failed with DVD-RAM/DVD-RW after message “Found damaged video, Recover video data?” appeared.	Initialize the disc (deleting all recorded data), or replace the disc.
Error occurred. Please replace disc.	Appears if repair has failed with BD-R/ DVD-R after message “Found damaged video, Recover video data?” appeared.	Replace the BD/DVD.
Failed to recover video data. Corrupted scenes have been deleted and disc is usable again	Appears when reading or writing any recorded files cannot be done due to dirt on BD.	Refer to "4-3-5 Cleaning BD/DVD and optical pickup" and clean the BD. Or replace the BD.
	Appears if recovery of video file failed when a HDD or BD was used.	Use the HDD/BD as is.
Finalize is not required.	Appears when the FINALIZE button was pressed with a BD-RE/DVD-RAM used.	A BD-RE/DVD-RAM does not need to be finalized: Wait until the message disappears.
Finalize may not be complete. Finalize again now? YES NO	Appears if accident, such as power off, occurred during finalizing, and then power was turned on again or BD/DVD was reloaded.	Choose “YES” and designate it to finalize the BD/DVD.
Found damaged video, Recover video data? YES NO	Appears when reading/writing of recorded files cannot be performed because the BD/DVD is dirty. If the message appears immediately after recognition of a loaded, recorded disc was finished, first check for dirt on BD/DVD.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/ DVD. Or replace the BD/DVD.
	Appears if writing to file cannot be completed normally because power was turned off by mistake during movie recording or editing, and it is recognized that the movie file must be totally repaired.	Choose “YES” and designate total repair (automatic repair) of movie file. Choosing “NO” will display a message for verifying initialization. [Refer to *3 on page 4-11]
Found partially damaged video. Recover video data? YES NO	Appears when reading/writing of recorded files cannot be performed because the BD/DVD is dirty. If the message appears immediately after recognition of a loaded, recorded disc was finished, first check for dirt on BD/DVD.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/ DVD. Or replace the BD/DVD.
	Appears if writing to file cannot be completed normally because power was turned off by mistake during movie recording or editing, and it is recognized that the movie file must be totally repaired.	Choose “YES” and designate total repair (automatic repair) of movie file. Choosing “NO” will display a message for verifying initialization. [Refer to *3 on page 4-11]
HDD almost full	Appears when the movie recordable capacity on the HDD is less than one minute.	Delete unnecessary scenes.

Message	Cause/condition for message to appear	Troubleshooting
HDD error has occurred.	Appears if a recorded file cannot be read or written normally.	Initialize the HDD (all recorded data will be deleted).
HDD error has occurred. Format the HDD now? YES NO	Appears when initializing the HDD was interrupted previously.	Choose “YES” when initializing (deleting all recorded data), and then execute.
HDD error has occurred. Formatting is not complete.	Appears when formatting of HDD was not completed normally, or it was interrupted.	Execute system reset (set the power switch to “OFF”, remove the power supply, use a fine-tipped pen to hold down the RESET button for a few seconds), and then format the HDD again.
HDD error has occurred. Restart.	Appears if a problem occurs in HDD during editing of video file.	Exit the Disc Navigation function, set the power switch to “OFF”, reconnect the AC adapter/charger, and turn the power switch to the "HDD" mode. (The camcorder will automatically repair the video file.)
HDD has no image.	Appears when playback or editing is attempted using the Disc Navigation function with no scene recorded on HDD.	Operate the camcorder after the message disappears.
HDD has no Play List.	Appears if switching of play list is selected with no play list registered.	Operate the camcorder after the message disappears.
HDD includes protected scenes. Delete scenes? YES NO	Appears if the HDD has a program (scene) that was write-protected by a device other than the DZ-BD7HA/BD70A. This occurs because the HDD protection function equipped with DZ-BD7HA/BD70A protects the entire HDD; it does not handle protection of individual programs (scenes).	Release the protection using the device on which the programs (scenes) were protected, or choose “YES”, and then delete the scenes.
HDD is full. Cannot add control info.	Appears if the number of scenes on play list exceeds the upper limit while control information is being added. [Refer to *1 page 4-11]	Delete any unnecessary scenes, or combine several scenes, and then operate the camcorder.
Insufficient free space available on disc. Delete unnecessary scenes.	Appears if a new playlist was created, a playlist was edited, or a scene was divided when the disc free space was insufficient.	Delete any unnecessary scenes, or reselect scenes. Or replace the BD/DVD with one giving sufficient free space.
Insufficient free space available on HDD. Delete unnecessary scenes.	Appears if a new playlist was created, a playlist was edited, or a scene was divided when the free space on HDD was insufficient.	Delete any unnecessary scenes, or reselect scenes. Or delete the scenes for which editing is complete after dubbing.
Low temperature. Cannot use BD. Turn off power, then turn on again.	Appears if the temperature of the BD or the ambient temperature is lower than the allowable operating temperature (5ºC) of BD drive unit when the camcorder is turned on.	Turn the power switch to “OFF”, and then turn it to “ON” again. If the message still appears even after the above operation, turn the power switch to “OFF”, and then move to a warmer place, making sure there is no condensation.

Message	Cause/condition for message to appear	Troubleshooting
No disc	Appears if no BD/DVD is loaded.	Load a BD/DVD
	Appears when a disc that cannot be used on the camcorder has been loaded.	Check the type of BD/DVD, and load a BD/DVD that can be used on this camcorder.
	Appears when the BD/DVD was not properly attached to the turntable.	Attach the BD/DVD properly.
	If any of the above does not apply, the camcorder may be faulty.	Refer to “4-5 Trouble Diagnosis ”.
No more scenes. Play List was deleted.	Appears during user operation; all recorded scenes have been deleted and cleared. The specifications stipulate that a play list with no scene on it cannot be held: If all registered scenes have been deleted, the play list will also be deleted.	Operate the camcorder after the message disappears.
Play Lists over limit. Cannot create Playlist.	Appears if an attempt is made to create a new play list or edit play list after the number of registered play lists has reached the upper limit (99) that is defined by the DVD video recording format.	Delete unnecessary scenes before creating a new play list or editing play list.
Same scenes on Play List will be deleted. Delete scenes? YES NO	This message appears during user operation, if even one play list has been created during scene deletion. This message does not appear when a scene is deleted from play list.	Choose “YES” and designate it to delete selected scenes.
Scene is too short. Cannot divide.	Appears if an attempt is made to divide an very short scene. If division of scenes is repeated, an extremely short scene may be generated.	Give up the division of scene.
Scene NO.xxx is too large. Please divide this scene before dubbing.	Appears if the capacity of the corresponding scene is greater than that of one BD (approx. 7.5 GB)/DVD (approx. 1.4 GB).	Divide the scene so that the capacity is less than that of one BD (approx. 7.5 GB)/DVD (approx. 1.4 GB).
Scenes over limit. Cannot add scene.	Appears if an attempt was made to add a new scene to the playlist in which the number of registrable scenes had reached the limit. [Refer to *1 page 4-11]	Delete unnecessary scenes from play list before adding a new scene to it.
Scenes over limit. Cannot divide scene.	Appears if an attempt was made to divide a scene when the number of scenes had reached the limit, of if dividing the scene caused the number of scenes to exceed the limit. [Refer to *1 on page 4-11.]	Delete unnecessary scenes before dividing a scene.
Stop processing.	This message appears during operation process. It will appear when user interrupted any process by pressing the stop/exit button when processing multiple scenes, etc.	Operate the camcorder after the message disappears.

Message	Cause/condition for message to appear	Troubleshooting
The temperature of HDD is outside the operating temperature range, Turn off power.	Appears if the temperature at the HDD, or the ambient temperature, was higher than the allowable operating temperature of HDD (60ºC).	Turn the power switch to "OFF", and then leave the camcorder in a well-ventilated spot until the temperature goes down. (The camcorder with a DVD loaded may operate normally.)
	Appears if the temperature of the HDD or ambient temperature was lower than the allowable operating temperature of HDD (5ºC).	Turn the power switch to "OFF", and move to a warmer place, making sure there is no condensation. (The camcorder with a DVD loaded may operate normally.)
There was no scene which can be deleted.	Appears when only multiple locked scenes were selected using the Disc Navigation function, and deleting them was attempted.	Use the Disc Navigation function to unlock the scenes, and then restart operation.
This disc cannot be used. Please replace disc.	Appears when a type of BD/DVD that cannot be used on the camcorder was loaded.	Check the type of BD/DVD and insert a disc usable on the camcorder.
This disc is finalized. Finalize is not required.	Appears when the FINALIZE button was pressed with a finalized DVD-RW (VF-mode)/DVD-R used.	The disc does not need to be finalized: Wait until the message disappears.
This disc is recorded by the PAL system. Please replace disc.	Appears when a disc recorded in the PAL system was loaded: This camcorder is exclusively for the NTSC system and does not comply with the PAL system.	Use a disc recorded in the NTSC system.
Unformat disc	Appears when an unformatted or logically damaged BD/DVD was loaded.	Format the BD/DVD (deleting all recorded data), or replace the BD/DVD.
	Also appears when a dirty BD/DVD was loaded.	Refer to “4-3-5 Cleaning BD/DVD and optical pickup” and clean the BD/DVD. Or replace the BD/DVD.
Unformat HDD	Appears if the HDD is not formatted.	Format the HDD.
	Also appears when the HDD is faulty.	Replace the HDD, and format the new HDD.
Use AC adapter/charger.	Appears if a battery is attached to the camcorder during dubbing, HDD full formatting or finalizing. This camcorder can use these functions only when the AC adapter/charger is attached.	Stop each operation, set the power switch to “OFF” with the BD/DVD left loaded, remove the battery, and connect the AC adapter/charger: Then retry the operation.
Use AC adapter/charger. Turn off power.	Appears if a battery is used when repairing video files. The specifications state that video files can be repaired only when the AC adapter/charger powers the camcorder.	Set the power switch to “OFF” with the BD/DVD loaded, remove the battery, and then connect the AC adapter/charger. [Refer to *3 on page 4-11]
Write protected. Check card.	Appears when an SD memory card whose erasure prevention switch was locked is loaded.	Unlock the erasure prevention switch of SD memory card.

Message	Cause/condition for message to appear	Troubleshooting
Write protected. Check disc.	Appears if a BD/DVD that was write-protected for disc units by software disc-protect function is loaded, or if an attempt is made to record on write-protected BD/DVD.	Release the software disc-protect.
Write protected. Check HDD.	Appears when a movie recorded on HDD has been edited, deleted, etc. with HDD protection engaged.	Release HDD protection.

Note:
The listed messages are subject to change without notice for improvement of performance.

*1: The maximum number of scenes that can be recorded on each recording media is specified by the standard and specifications as follows:

HDD: 999
BD-RE/BD-R: 999
DVD-RAM/DVD-RW: 999
DVD-R: 930

*2: If recording is continued without editing, one scene will comprise one cell for each entry point, so the number of cells can be counted to determine the number of scenes.
Dividing a scene and combining scenes means both the addition and deletion of an entry point, so the number of cells will not increase or decrease. When deleting the divided scene, however, the cell will be also divided (the number of cells will increase). If the number of cells has reached the registrable limit of scenes at this time, the cell cannot be divided and the scene cannot be deleted.

*3: Take care with the following when repairing video file:

a) If any message appears when the power switch was moved from “OFF” to “BD/DVD” with the BD/DVD left loaded after camera recording, choose repair.
b) If recording and playback are possible with another BD/DVD, which is free from condensation or dirt, choose repair.
c) Connect the AC adapter/charger when repairing video files. However, the video files on HDD can be repaired using a battery connected (limited to a battery with remaining power level more than the half). The specifications state that repairing video files on BD/DVD can be executed only when the AC adapter/charger is connected.
d) Although repair is normally finished in several minutes, it could take approx. one hour.
e) If the BD/DVD is removed while it is being recognized, the repair function of movie file will be invalid.
f) If the timing when power is turned off is inappropriate, normal repair may be impossible.
g) If the disc contains data recorded on a device other than DZ-BD7HA/BD70A, normal repair may not be possible.
h) The repaired data may be different from the original recorded content because of partial deletion of a defective portion.
i) The repaired data (only corrected portion in case of partial repair) will lose the original date/time information because the information for date/time when repair was executed will be added.
j) If "all repair” is executed, repair will be made in the order of all videos and all photos, and the time-sequential relationship of recorded contents may be lost.

4-3 Display of Error Codes and Troubleshooting

Restriction:
The information included in this section is exclusively for service personnel: Do not disclose it to persons other than service engineers.

The camcorder is equipped with a self-diagnostic function: If the camcorder detects any problem, it will choose an appropriate error code (4-digit alphanumeric) and store it in flash memory: Display the error code to perform troubleshooting, according to the content.

4-3-1 Displaying error codes and clearing them

(1) Display method

1) Use the battery or AC adapter/charger to power the camcorder.
2) Set the Movie/Still switch to "Movie", and then turn the power switch to the "ON" position.
   (The DZ-BD7HA can display error codes in both HDD and BD/DVD modes.)
   Then operate the camcorder while watching the LCD monitor or viewfinder.
3) Display the error code screen using the following button operation:
   Simultaneously press the QUICK START, REC buttons and joystick ⏭.

(2) Display clearing method

1) Press the STOP/EXIT button to restore the thumbnail screen.

4-3-2 Details of error code display

Up to four error codes of problems can be displayed with the dates/times when the problems occurred.
If the same problem occurs repeatedly, it will be judged as one problem, and the same error code will not continue to appear.
If more than four problems occur, the error codes will be erased beginning with the oldest problem, and the code for the newest problem will be recorded.
If no error code is recorded, the line for error code and problem occurrence date/time will be all zero (0).

Information:
To erase all error codes and reset to the default status, perform system reset (remove the battery and AC adapter/charger, and use a fine-tipped pen to hold down the reset button for several seconds).

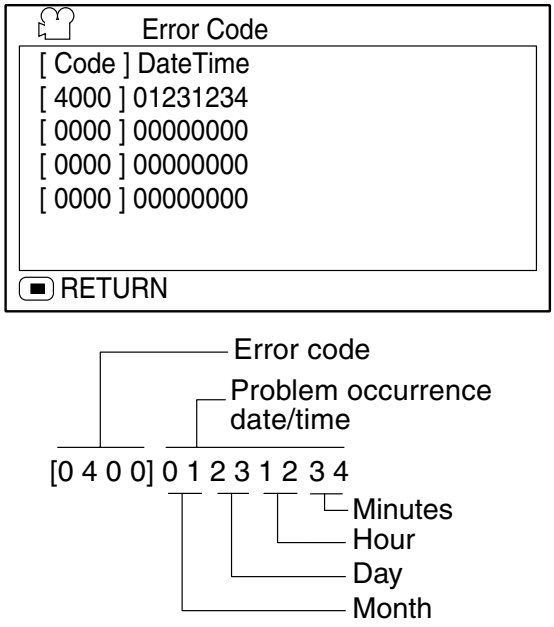


Fig. 4-3-1 Example of Error Code Display

4-3-3 Major error codes and troubleshooting

Table 4-3-1 shows the error codes that are likely to frequently appear, and appropriate troubleshooting.

If error codes other than those listed in Table 4-3-1 appear, check with the factory for troubleshooting.

Table 4-3-1 Major Error Codes and Troubleshooting

Error code	Contents of problem	Troubleshooting
0200	Optical pickup failed to move.	Refer to “4-3-4 BD/DVD load check flowchart”
0280		
0400	Recognition of BD/DVD failed.	
0401	Optical pickup was faulty.	Replace the BD drive unit.
040D	No BD/DVD	Load a BD/DVD.
1001	DVD-RW was not formatted.(*1)	Format the DVD-RW
1100	Reading data from BD/DVD failed.	Refer to “4-3-4 BD/DVD load check flowchart”
2881	Recognition of BD/DVD failed.	Refer to “4-3-4 BD/DVD load check flowchart”
3105	Recording photos failed because of condensation in BD drive unit (optical pickup) or dirt on optical pickup.	Set the power switch to “OFF”, and then leave the camcorder in a dry place until condensation disappears (for at least 1-2 hours).
		Clean the optical pickup, referring to “4-3-5 Cleaning BD/DVD and optical pickup”.
3122	Recording on BD/DVD failed because it was subject to vibrations or impact when it was being accessed.	Any vibration or impact to BD/DVD while it is being accessed will result in no recording.
5122	Movie or still file cannot be opened.	Clean the BD/DVD and optical pickup, referring to “4-3-5 Cleaning BD/DVD and optical pickup”.
		Replace the BD/DVD.
		Replace the BD drive unit.
7601	Optical pickup was faulty.	Replace the BD drive unit.
77xx (*2)	Formatting BD/DVD failed.	Clean the BD/DVD and optical pickup, referring to “4-3-5 Cleaning BD/DVD and optical pickup”.
		Replace the BD/DVD.
		Replace the BD drive unit.
7902	BD/DVD insertion block does not open.	Make sure your hand is not blocking the BD/DVD insertion block.
		Remove the BD/DVD, referring to "4-6 Procedure for Removing BD/DVD from Faulty Camcorder", and then refer to "4-5 Trouble Diagnosis".
A080	Reading signal from disc failed due to condensation or dirt on BD/DVD.	With the BD/DVD loaded, set the power switch to “OFF”, and then leave the camcorder in a dry place until condensation disappears (for at least 1-2 hours).
		Clean the optical pickup, referring to “4-3-5 Cleaning BD/DVD and optical pickup”.
EC87	Emergency stop occurred while data was being read or written from/to BD/DVD.	Refer to “4-3-4 BD/DVD load check flowchart”
F100	Buffer overflowed during recording due to foreign object in the vicinity of optical pickup, or optical pickup was faulty.	Remove the foreign object, taking care that the optical pickup is not damaged.
		Replace the BD drive unit.
F571	Recording still failed.	Replace the SD memory card.

Error code	Contents of problem	Troubleshooting
F572	Recording Movies failed due to magnetic substance in the vicinity of optical pickup.	Remove the magnetic substance, taking care that the optical pickup is not damaged.
F573		
F700	BD drive unit was faulty.	Replace the BD drive unit.
FB00	Optical pickup was faulty.	
FE80	Process of writing data to BD/DVD failed.	Refer to “4-3-4 BD/DVD load check flowchart”

*1: "Formatting DVD-RW on the camcorder" is exclusively for camera recording:
It is necessary to write images recorded on the camcorder in real time (in order to enhance the responsiveness of DVD-RW).
With DVD-RW, the recording mode (VR or VF mode) must be set during initialization.

*2: This means an error in 7700s: Numerals will appear in digits xx for actual error codes.

4-3-4 BD/DVD Load Check Flowchart

Check the following only when an instruction for referring to this chart is given in "Table 4-3-1 Major Error Codes and Troubleshooting" on the previous item.

Caution

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the camcorder before starting work.

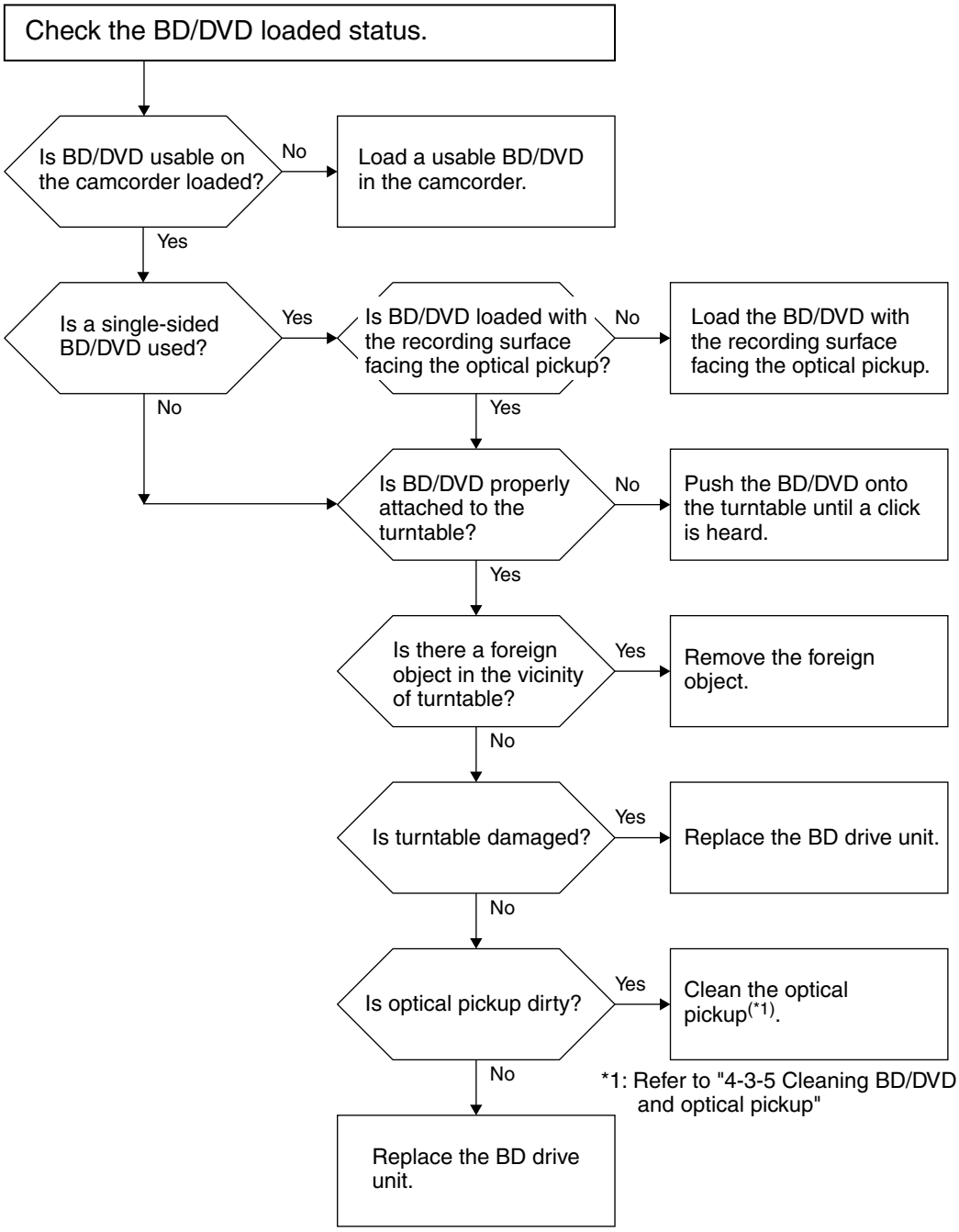

Check the BD/DVD loaded status.
Is BD/DVD usable on the camcorder loaded?
No
Load a usable BD/DVD in the camcorder.
Yes
Is a single-sided BD/DVD used?
Yes
Is BD/DVD loaded with the recording surface facing the optical pickup?
No
Load the BD/DVD with the recording surface facing the optical pickup.
No
Yes
Is BD/DVD properly attached to the turntable?
No
Push the BD/DVD onto the turntable until a click is heard.
Yes
Is there a foreign object in the vicinity of turntable?
Yes
Remove the foreign object.
No
Is turntable damaged?
Yes
Replace the BD drive unit.
No
Is optical pickup dirty?
Yes
Clean the optical pickup(*1).
No
*1: Refer to "4-3-5 Cleaning BD/DVD and optical pickup"
Replace the BD drive unit.

Fig. 4-3-2 BD/DVD Load Check Flowchart

4-3-5 Cleaning BD/DVD and optical pickup

(1) Cleaning BD/DVD

1) Use the provided disc cleaning cloth, or a soft, dry cloth to lightly clean the BD/DVD from the inner to outer edges in axial direction.
2) If the dirt cannot be removed with the above procedure, put a few droplets of absolute alcohol in a soft, dry cloth, and use it to lightly clean the BD/DVD from the inner to outer edges in axial direction.

Fig. 4-3-3 Cleaning BD/DVD

Information:
The following disc cleaners and cleaning cloths (generally available) are also usable:
a) KS2424-X00 Toraysee (cleaning cloth only) produced by Toray
b) LF-K200DCJ1 DVD-RAM/PD disc cleaner (cleaning cloth and cleaning liquid) produced by Panasonic
c) DVD-8CL(S) 8cm DVD video camera lens cleaner (cleaning disc and cleaning cloth) produced by Hitachi Maxell

(2) Cleaning optical pickup

Note:
Do not clean the optical pickup needlessly. The optical pickup is a precision component. Repeated cleaning could cause a fault.

1) Attach the AC adapter/charger or battery (power supply), and then press the DISC EJECT button to open the disc insertion block.
2) Remove the AC adapter/charger or battery (power supply).

Caution

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the camcorder before starting work.

3) Check to see whether the optical pickup is dirty: If it is not dirty, cleaning is not necessary.
If the optical pickup is dirty, use the following procedure to clean it:

a) Apply one drop of the specified cleaning liquid (*2) to a cotton swab (*1) that does not contain any additive or chemical.

b) Wipe the optical pickup in the direction of the arrow with enough force that the pickup slightly sinks: Applying undue force or wiping in the wrong direction could cause a fault. This camcorder uses two optical pickups for BD and DVD: Carefully clean both, one at a time.

c) Wipe off any remaining moisture from the pickups using a dry cotton swab (*1) that does not contain any additive or chemical.

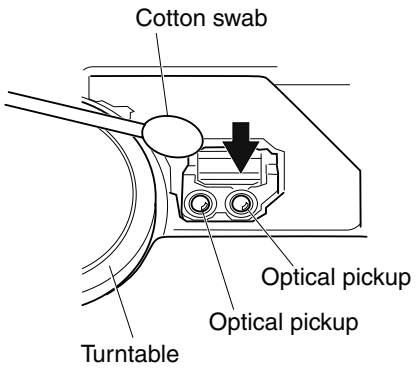


Fig. 4-3-4 Cleaning Optical Pickup

*1: Cotton swabs produced by Johnson & Johnson K.K. are recommended. Do not reuse a cotton swab used for cleaning.

*2: Plastic lens cleaner B-4 (IPA) produced by JCB Industry Limited.

4-4 Checking Versions of Firmware and Updating

The camcorder stores in flash memory the nine types of firmware program shown in Table 4-4-1.

Information:

1) The information on how to upgrade the firmware, obtain firmware data and create a disc or card containing upgraded firmware will be reported on service bulletin, etc.

2) Updating the firmware may improve a malfunction of product: Check the version of firmware in the product received from customer, and update the firmware as needed.

Table 4-4-1 List of Camcorder Firmware Programs

Display	Name of firmware	Description
IPL	Boot Loader	Performs settings when the Camcorder starts.
KERNEL	Kernel	Controls the operation of entire system, including recording, playback, Disc Navigation, connections with external devices, clock, battery, input/output etc..
APPLI	Application	
GUI	Graphical User Interface	
DRIVE (Main)	Drive main	These programs control the BD drive system (mechanism block).
DRIVE (Core)	Drive core	
CAMERA	Camera	Controls the operation of camera block (including optical system).
EEPROM	EEPROM	Different data for models.
HDD	Hard Disc Drive	Controls the HDD. (DZ-BD7HA only)

4-4-1 Checking firmware versions

(1) Version check screen display method

1) Attach the battery pack or AC adapter/charger to power the camcorder.
2) Set the Movie/Still switch to "Movie", and then turn the power switch to the "ON" position. (The DZ-BD7HA can display the firmware version in both HDD and BD/DVD modes.)
   Then operate the camcorder while watching the LCD monitor or viewfinder.
3) Display the version check screen (version screen) using the following button operation:
   Simultaneously press the QUICK START, REC buttons and joystick ⏮.

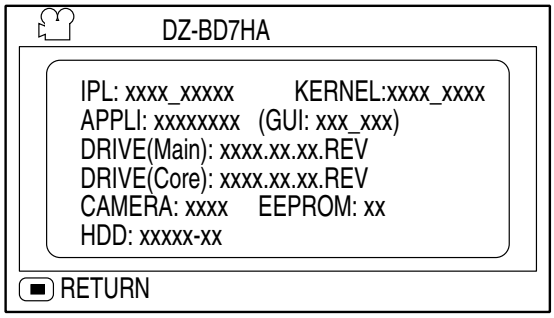


Fig. 4-4-1 Example of Version Screens

Information:
1) With actual screens, figures and letters will appear in digits displayed as x on illustrations.
2) "HDD" is not usually a target of updating.

(2) Version check screen display clearing method

1) Press the STOP/EXIT button to restore the normal screen.

4-4-2 Updating firmware

If you receive information from the factory on technical bulletin, etc. that updating firmware is needed, you should update to improve the performance, functions and operability of camcorder.

Caution
Be sure to acquire the appropriate data before updating the corresponding model, and then create a DVD-RAM/SD memory card (more than 16MB) for updating.
If a DVD-RAM/SD memory card for updating a model other than that to be serviced is inserted, an mismatch screen will appear: Stop updating and remove the DVD-RAM/SD memory card.

1) Acquire the data for updating of firmware and create a DVD-RAM or SD memory card for updating: Information on how to do this will be reported on service bulletin, etc.
2) Set the power switch to “OFF”, and then use the AC adapter/charger to power the camcorder:
   A battery cannot be used to do this because it may interrupt power of camcorder during updating.
3) Insert the DVD-RAM/SD memory card for updating.
4) When using the card for updating, set the Movie/Still switch to "Still", and then turn the power switch to "ON"; when using the disc for updating, set the Movie/Still switch to "Movie", and then turn the power switch to "ON". With the DZ-BD7HA, also use the power switch to choose the "BD/DVD" mode.

5) After approx. 20 seconds, the updating start screen (Fig. 4-4-2) will appear, and the firmware programs will be automatically updated thereafter. During updating, screens showing that designated firmware program is being updated will appear, followed by screen showing that updating is complete.
   Not all firmware programs need updating every time: If the version of the data on DVD-RAM/SD memory card for updating is identical to that of firmware stored in camcorder, the same version screen will appear.
6) When all required updating is complete, the screen for verifying the version of updated firmware will appear, and the updated firmware will be displayed in red.
   Make sure that the firmware has been updated to agree with the details specified by the technical bulletin, etc.
7) To complete updating, set the power switch to "OFF", and then remove the DVD-RAM/SD memory card for updating.

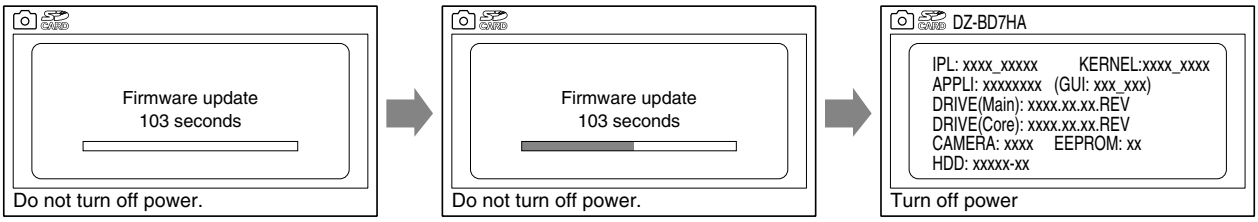


Fig. 4-4-2 Example of Display on Updating Firmware

4-5 Trouble Diagnosis

Information:
1) Use the AC adapter/charger to power the camcorder for trouble diagnosis.
2) The trouble diagnosis flowchart was prepared presupposing that the circuit boards have been normally attached and connected. Therefore, make sure beforehand that the circuit boards are correctly connected, that connectors and cables are not damaged, and that the status of their connections is correct.

Cautions
1) The camcorder incorporates a high-voltage flash unit. Take electric shock prevention measures, such as wearing gloves, etc., and perform troubleshooting with great care.
2) Never look into the objective lens of optical pickup block in disc drive unit, and take great care that the reflected laser beam does not strike your eye: Doing so could cause serious vision damage.

The following shows troubleshooting for the symptoms shown below:

Power supply system
- Power does not turn on, or start up normally

HDD system (For DZ-BD7HA)
- HDD does not operate.
- Message “HDD access” does not disappear.

Disc system
- Recognition of BD/DVD does not start even if a normal BD/DVD is loaded.
- Message "No disc" appears even if a normal BD/DVD is loaded.
- Message "Disc access" does not disappear even if a normal BD/DVD is loaded.
- Message "Write protected. Check disc" appears even if a BD/DVD with no write-protect is loaded.
- Message "Disc is not formatted. Format the disc now?" appears even if a formatted BD/DVD is loaded.

Video signal system
- No image appears on LCD monitor.
- No image appears in viewfinder.
- No video signal from A/V output jack.
- Block noise occurs during recording of video.
- Camera recorded image is abnormal.

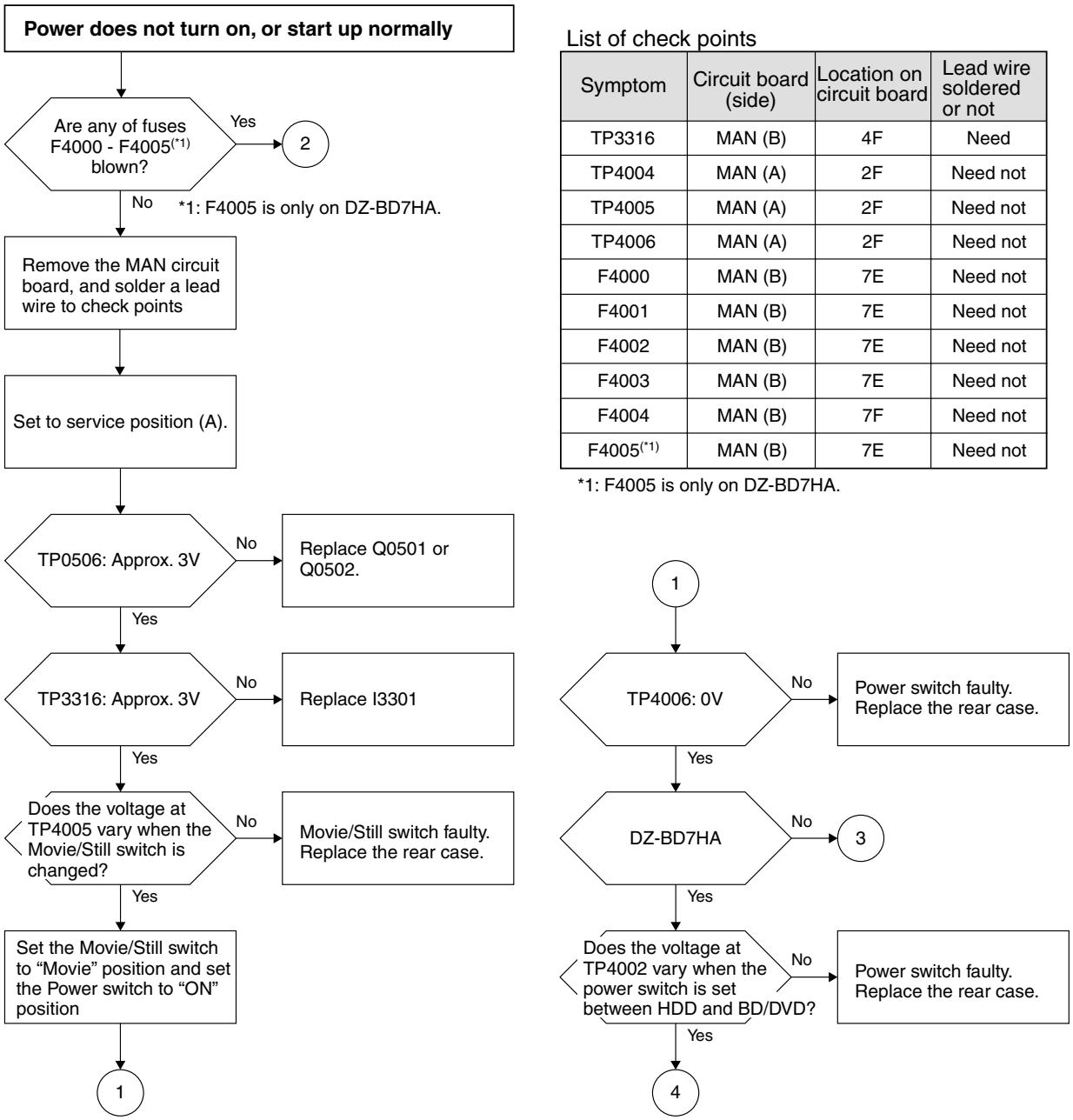
Audio signal system
- No audio from A/V output jack.
- No audio can be recorded from internal microphone.
- No audio can be recorded from external microphone.
- No sound from speaker during playback of video.

Operation system/Miscellaneous
- DISC EJECT button does not operate.
- PHOTO button (focus lock) does not function.
- Operation buttons on L case do not function.
- REC button does not operate.
- Zoom lever does not operate.
- Autofocus does not operate.
- Date or time is not set.

4-5-1 Trouble diagnosis flowchart

Interpreting the trouble diagnosis flowchart:

1) If removing any component is stated in the flowchart, remove that component, referring to "5. Disassembly and Reassembly".
2) If "Solder a lead wire to check point" is stated, solder a lead wire of approx. 10 cm according to the list of check point: Be sure to remove the lead wire after trouble diagnosis is finished.
3) If "Set to service position (A) or (B)" is given in the flowchart, set the camcorder to the appropriate service position, referring to "4-5-2 Reassembly to enable service position".



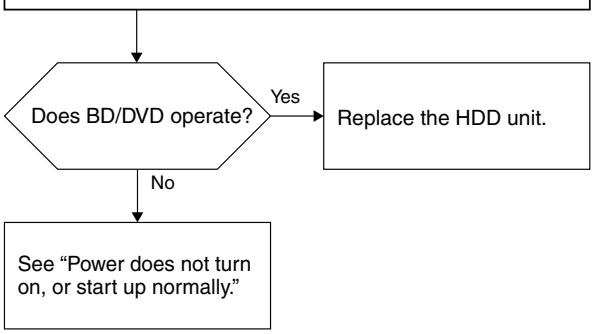
List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP3316	MAN (B)	4F	Need
TP4004	MAN (A)	2F	Need not
TP4005	MAN (A)	2F	Need not
TP4006	MAN (A)	2F	Need not
F4000	MAN (B)	7E	Need not
F4001	MAN (B)	7E	Need not
F4002	MAN (B)	7E	Need not
F4003	MAN (B)	7E	Need not
F4004	MAN (B)	7F	Need not
F4005(*1)	MAN (B)	7E	Need not

*1: F4005 is only on DZ-BD7HA.

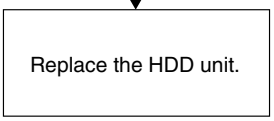
2
Replace blown fuse and re-supply power
Yes
No improvement
Is fuse F4002 blown?
Yes
Replace the BD drive unit and F4002
No
Is fuse F4004 blown?
Yes
Replace the LCD unit and F4004
No
Is fuse F4005 blown?
Yes
Replace the MAN circuit board.
No improvement
Replace the HDD unit and F4005.
No
Is fuse F4003 blown?
Yes
Replace the MAN circuit board.
No improvement
Replace the BD drive unit and F4003.
No
After replacing the fuse, supply power with no 5MCMOS, GYRO or AEL circuit board connected.
Is fuse F4000 or F4001 blown?
Yes
Replace the MAN circuit board.
No
After replacing the fuse, supply power with 5MCMOS circuit board connected.(*2)
*2: No GYRO or AELcircuit board connected.
Is fuse F4000 blown?
Yes
Replace the Sensor Assembly.(*3)
*3: The sensor assembly comprises the 5MCMOS board on which a CMOS sensor is mounted.
No
After replacing the fuse, supply power with GYRO and 5MCMOS circuit boards connected.(*4)
*4: No AELcircuit board connected.
5
3
Set the Movie/Still switch between “Movie” and “Still”.
Does power start up in both Movie and Still modes?
No
Replace the MAN circuit board.
Yes
Does power start up in Movie mode?
No
Replace the BD drive unit.
Yes
Replace the MAN circuit board.
4
Does power start up in both HDD and BD/DVD modes?
No
Replace the MAN circuit board.
Yes
Does power start up in HDD mode?
No
Replace the HDD unit.
Yes
Replace the BD drive unit.
5
Is fuse F4000 or F4001 blown?
Yes
Replace the GYRO circuit board
No
Replace the AEL circuit board

HDD does not operate. (For DZ-BD7HA)

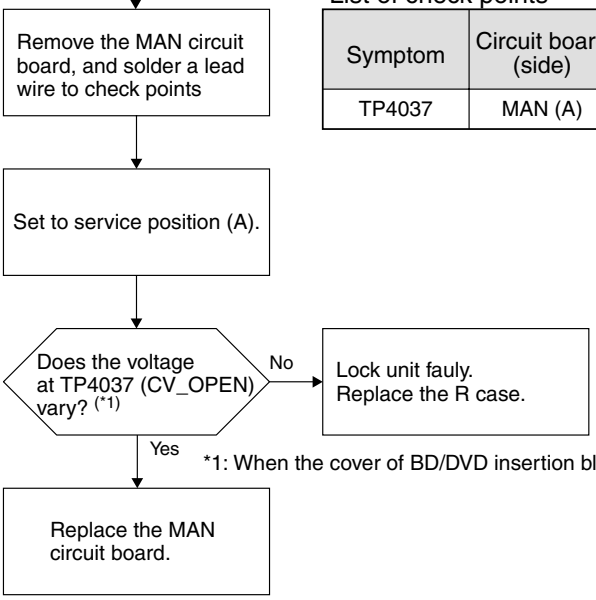


Information:
With the DZ-BD7HA, the HDD unit is set to master, and the BD drive unit is set to slave. Therefore, if the HDD unit is electrically faulty, the DZ-BD7H may not recognize the BD drive unit and the BD drive unit may not operate.

Message “HDD ACCESS” does not disappear. (For DZ-BD7HA)



Recognition of BD/DVD does not start even if a normal BD/DVD is loaded.


Remove the MAN circuit board, and solder a lead wire to check points
Set to service position (A).
Does the voltage at TP4037 (CV_OPEN) vary? (*1)
No
Lock unit fauly.
Replace the R case.
Yes
Replace the MAN circuit board.

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4037	MAN (A)	4E	Need

*1: When the cover of BD/DVD insertion block is opened or closed

Message "No disc" appears even if a normal BD/DVD is loaded.

Remove the MAN circuit board, and solder a lead wire to check points

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4037	MAN (A)	4E	Need

Set to service position (A).

Does the voltage at TP4037 (CV_OPEN) vary? (*1)

No → Lock unit fauly. Replace the R case.

Yes → Replace the MAN circuit board.

*1: When the cover of BD/DVD insertion block is opened or closed

Message "Disc access" does not disappear even if a normal BD/DVD is loaded.

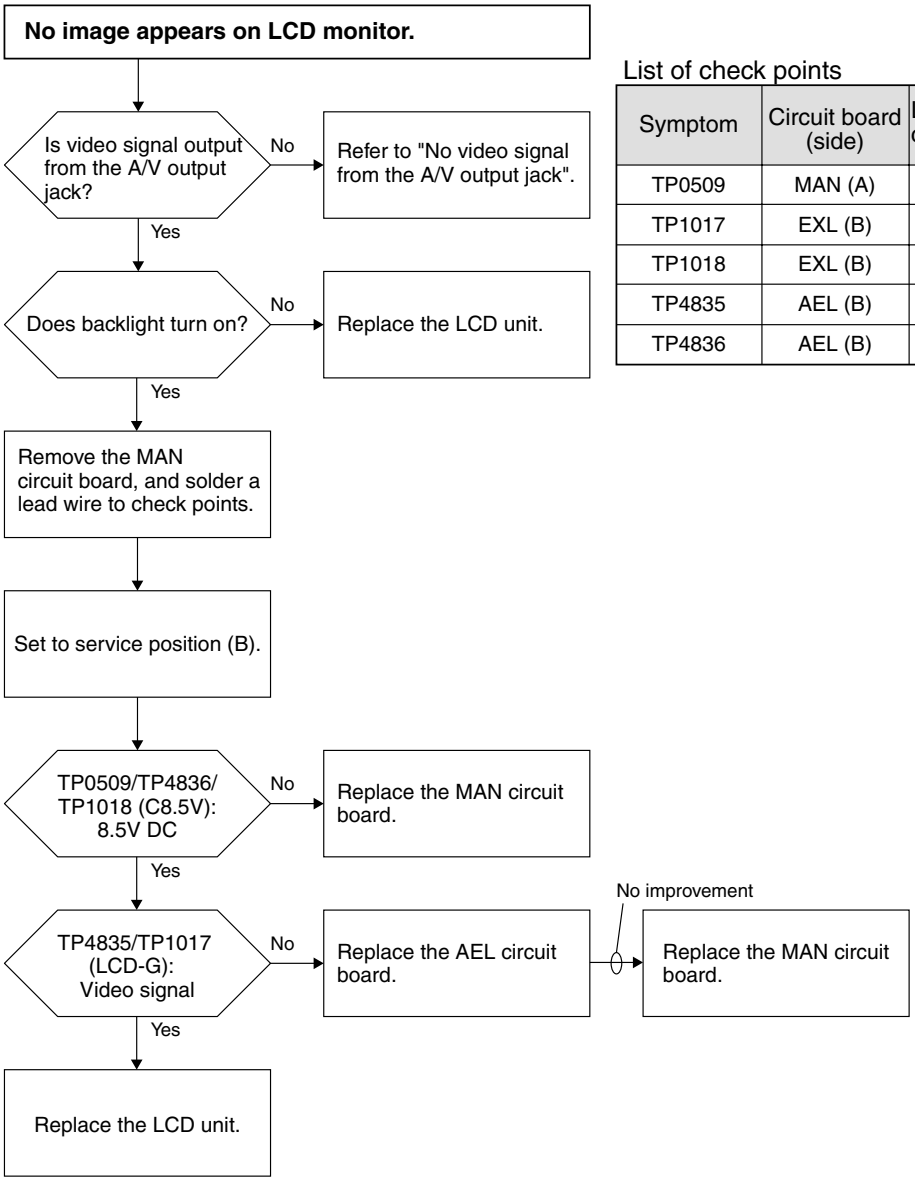
Replace the BD drive unit.

Message "Write protected. Check disc" appears even if a BD/DVD with no write-protect is loaded.

Replace the BD drive unit.

Message "Disc is not formatted. Format the disc now?" appears even if a formatted BD/DVD is loaded.

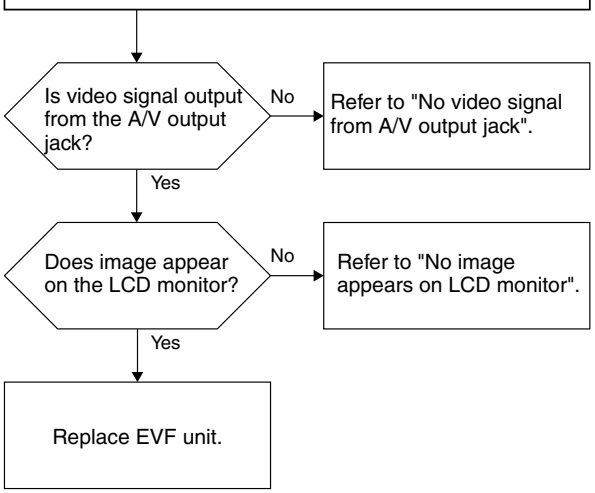
Replace the BD drive unit


No image appears on LCD monitor.
Is video signal output from the A/V output jack?
No
Refer to "No video signal from the A/V output jack".
Yes
Does backlight turn on?
No
Replace the LCD unit.
Yes
Remove the MAN circuit board, and solder a lead wire to check points.
Set to service position (B).
TP0509/TP4836/ TP1018 (C8.5V): 8.5V DC
No
Replace the MAN circuit board.
Yes
TP4835/TP1017 (LCD-G): Video signal
No
Replace the AEL circuit board.
No improvement
Replace the MAN circuit board.
Yes
Replace the LCD unit.

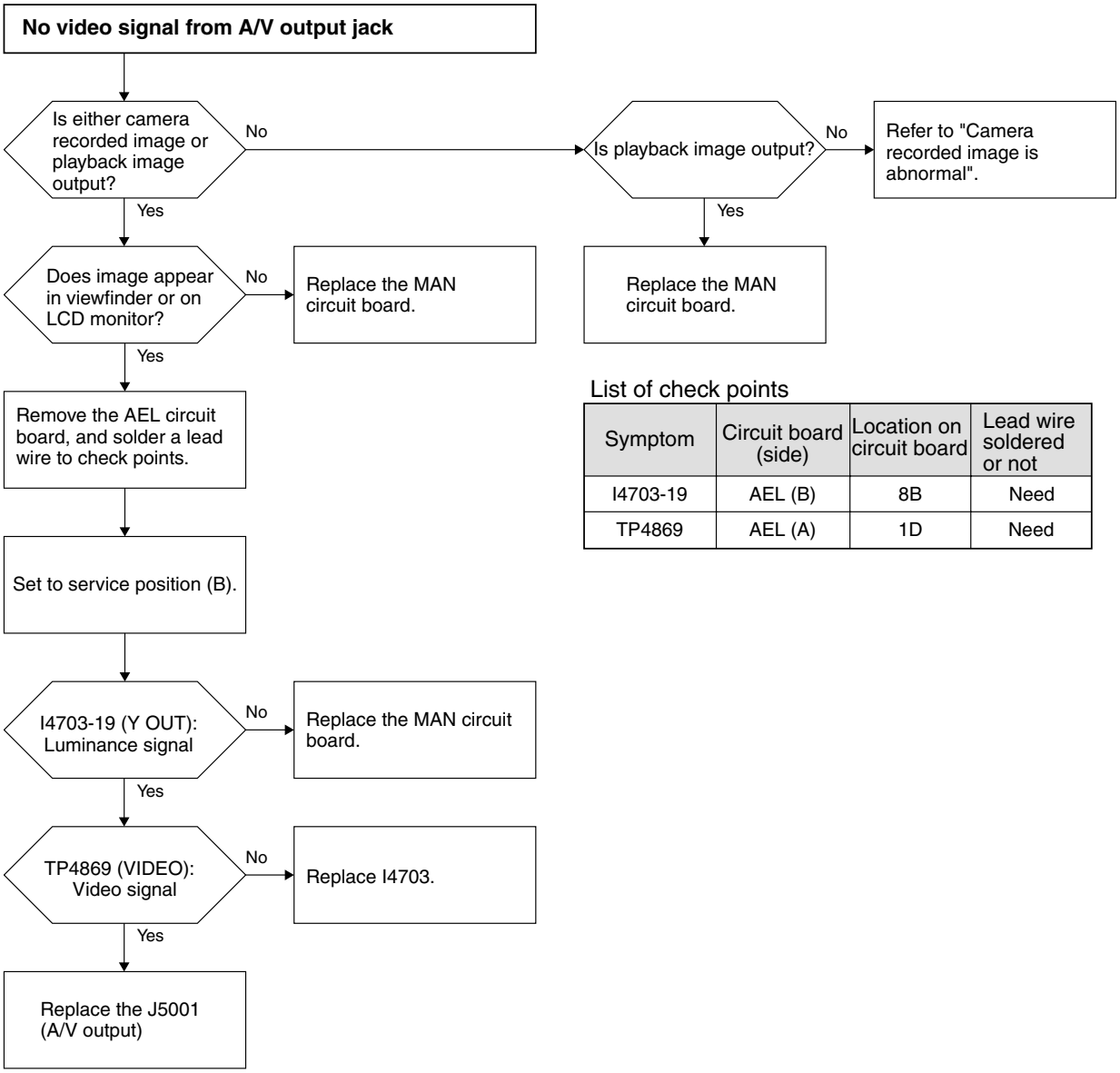
List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP0509	MAN (A)	2E	Need
TP1017	EXL (B)	4B	Need
TP1018	EXL (B)	3B	Need not
TP4835	AEL (B)	5C	Need
TP4836	AEL (B)	5C	Need

No image appears in viewfinder.


Is video signal output from the A/V output jack?
No
Refer to "No video signal from A/V output jack".
Yes
Does image appear on the LCD monitor?
No
Refer to "No image appears on LCD monitor".
Yes
Replace EVF unit.

No video signal from A/V output jack



List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
I4703-19	AEL (B)	8B	Need
TP4869	AEL (A)	1D	Need

Block noise occurs during recording of video.

Replace the MAN circuit board.

Camera recorded image is abnormal

Remove the MAN circuit board, and solder a lead wire to check points

Set to service position (A).

TP0506 (C3V): Approx. 3V

No → Replace Q0501 and Q0502.

Yes

TP0502 (C1.8V): 1.8V

No → Replace Q0503 and Q0504.

Yes

TP2000 (HSYNC), TP2007 (VSYNC): Pulses

No → Replace the MAN circuit board.

Yes

Replace the Sensor Assembly.(*1)

*1: The sensor assembly comprises the 5MCMOS board on which a CMOS sensor is mounted.

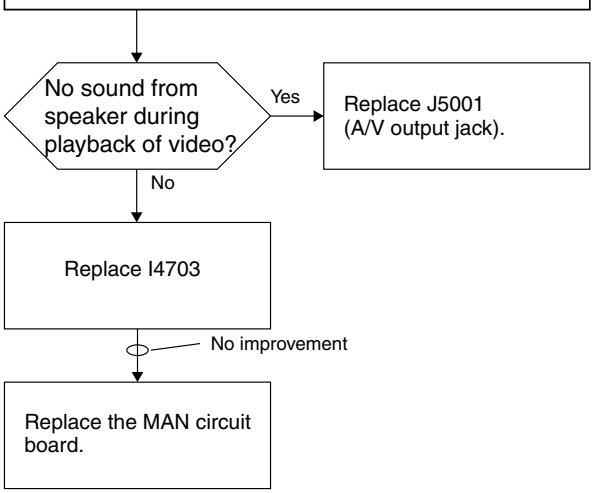
No improvement

Replace the MAN circuit board.

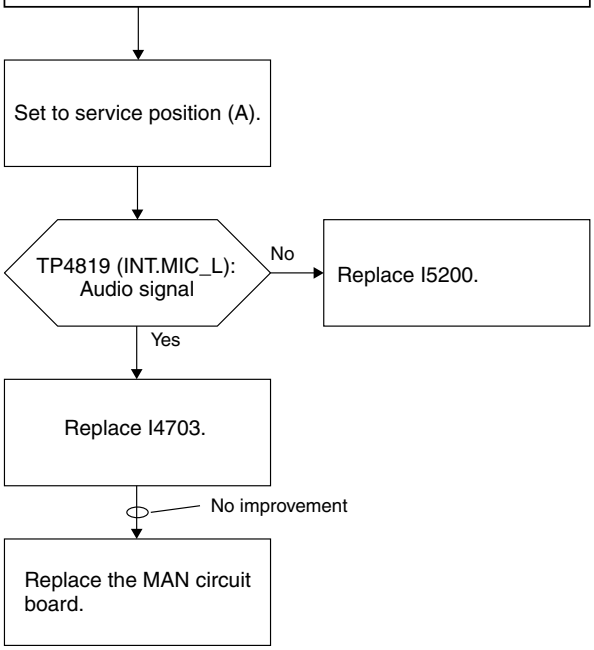
List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP0502	MAN (A)	4B	Need
TP0506	MAN (B)	7B	Need
TP2000	MAN (B)	6B	Need
TP2007	MAN (B)	6B	Need

No audio from A/V output jack.



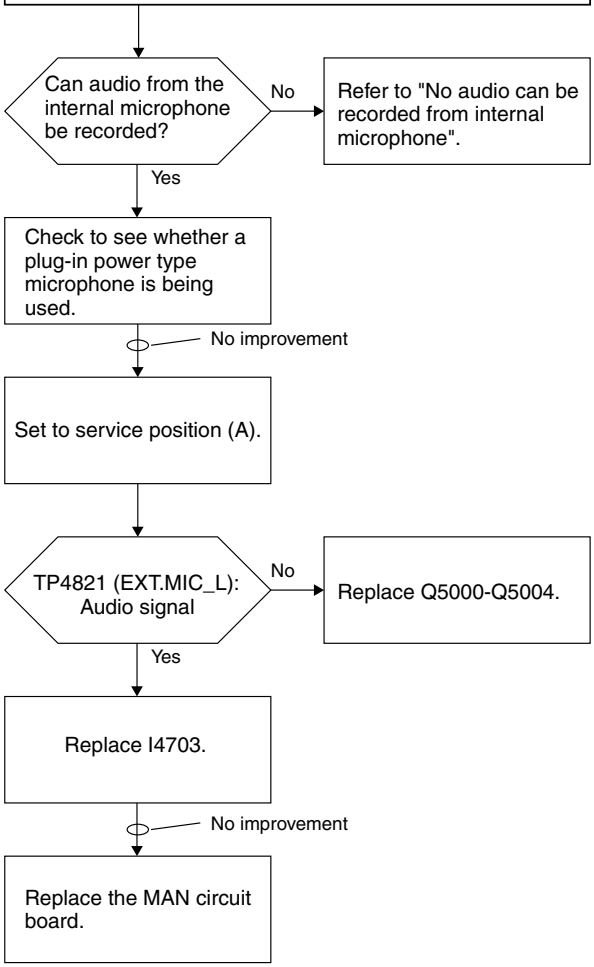
No audio can be recorded from internal microphone.



List of check points

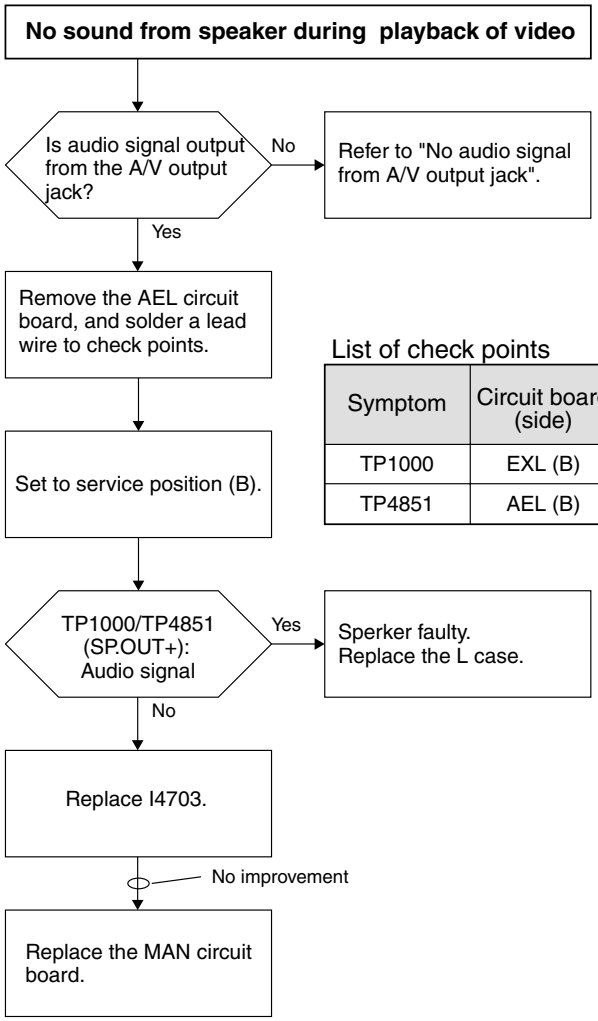
Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4819	AEL (A)	2E	Need not

No audio can be recorded from external microphone.


Can audio from the internal microphone be recorded?
No
Refer to "No audio can be recorded from internal microphone".
Yes
Check to see whether a plug-in power type microphone is being used.
No improvement
Set to service position (A).
TP4821 (EXT.MIC_L): Audio signal
No
Replace Q5000-Q5004.
Yes
Replace I4703.
No improvement
Replace the MAN circuit board.

List of check points

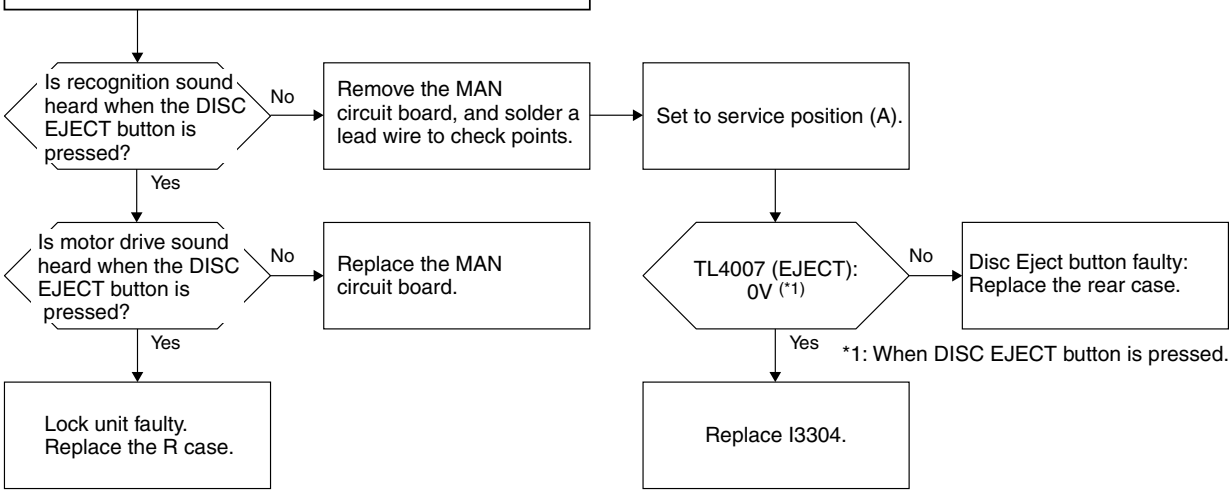
Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4821	AEL (A)	2E	Need not


No sound from speaker during playback of video
Is audio signal output from the A/V output jack?
No
Refer to "No audio signal from A/V output jack".
Yes
Remove the AEL circuit board, and solder a lead wire to check points.
Set to service position (B).
TP1000/TP4851 (SP.OUT+): Audio signal
Yes
Sperker faulty. Replace the L case.
No
Replace I4703.
No improvement
Replace the MAN circuit board.

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP1000	EXL (B)	3C	Need not
TP4851	AEL (B)	5C	Need

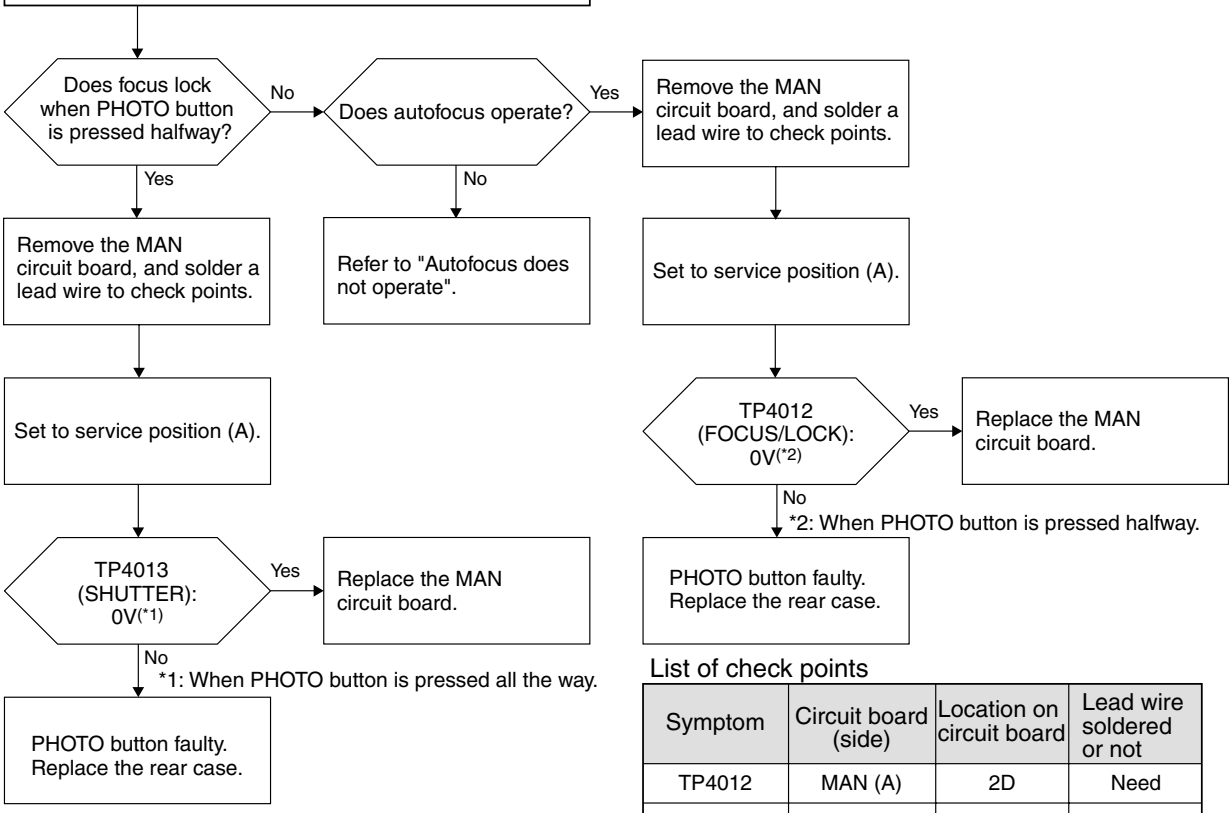
DISC EJECT button does not operate.


Is recognition sound heard when the DISC EJECT button is pressed?
No
Remove the MAN circuit board, and solder a lead wire to check points.
Set to service position (A).
Yes
Is motor drive sound heard when the DISC EJECT button is pressed?
No
Replace the MAN circuit board.
TL4007 (EJECT): 0V (*1)
No
Disc Eject button faulty: Replace the rear case.
Yes
Yes
*1: When DISC EJECT button is pressed.
Lock unit faulty. Replace the R case.
Replace I3304.

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TL4007	MAN (A)	3F	Need

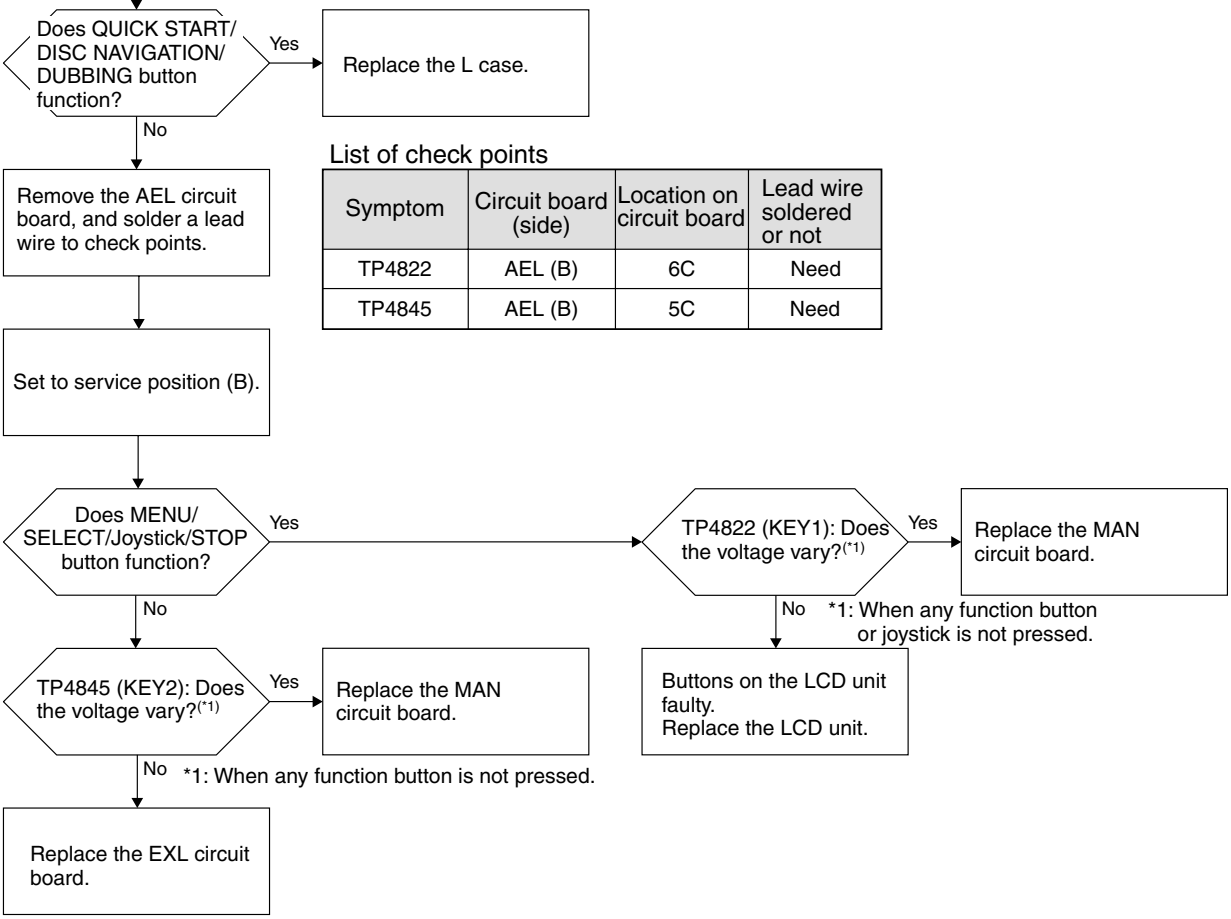
PHOTO button (focus lock) does not function.


Does focus lock when PHOTO button is pressed halfway?
No
Does autofocus operate?
Yes
Remove the MAN circuit board, and solder a lead wire to check points.
Yes
No
Remove the MAN circuit board, and solder a lead wire to check points.
Refer to "Autofocus does not operate".
Set to service position (A).
Set to service position (A).
TP4012 (FOCUS/LOCK): 0V(*2)
Yes
Replace the MAN circuit board.
No
*2: When PHOTO button is pressed halfway.
TP4013 (SHUTTER): 0V(*1)
Yes
Replace the MAN circuit board.
PHOTO button faulty. Replace the rear case.
No
*1: When PHOTO button is pressed all the way.
PHOTO button faulty. Replace the rear case.

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4012	MAN (A)	2D	Need
TP4013	MAN (A)	2D	Need

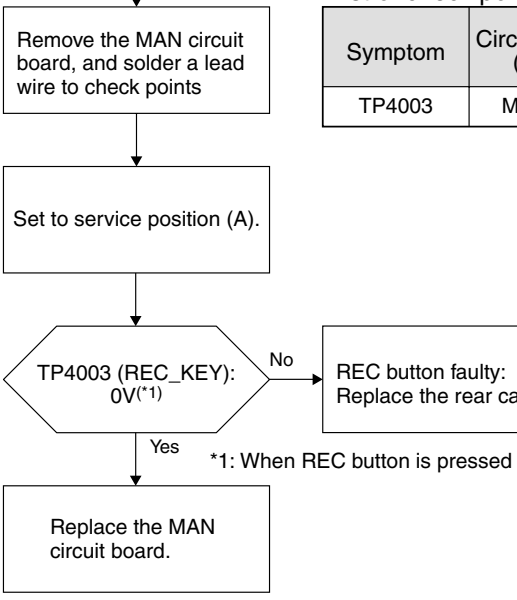
Operation buttons on L case do not function.


Does QUICK START/ DISC NAVIGATION/ DUBBING button function?
Yes
Replace the L case.
No
Remove the AEL circuit board, and solder a lead wire to check points.
Set to service position (B).
Does MENU/ SELECT/Joystick/STOP button function?
Yes
TP4822 (KEY1): Does the voltage vary?(*1)
Yes
Replace the MAN circuit board.
No
*1: When any function button or joystick is not pressed.
TP4845 (KEY2): Does the voltage vary?(*1)
Yes
Replace the MAN circuit board.
Buttons on the LCD unit faulty. Replace the LCD unit.
No
*1: When any function button is not pressed.
Replace the EXL circuit board.

List of check points

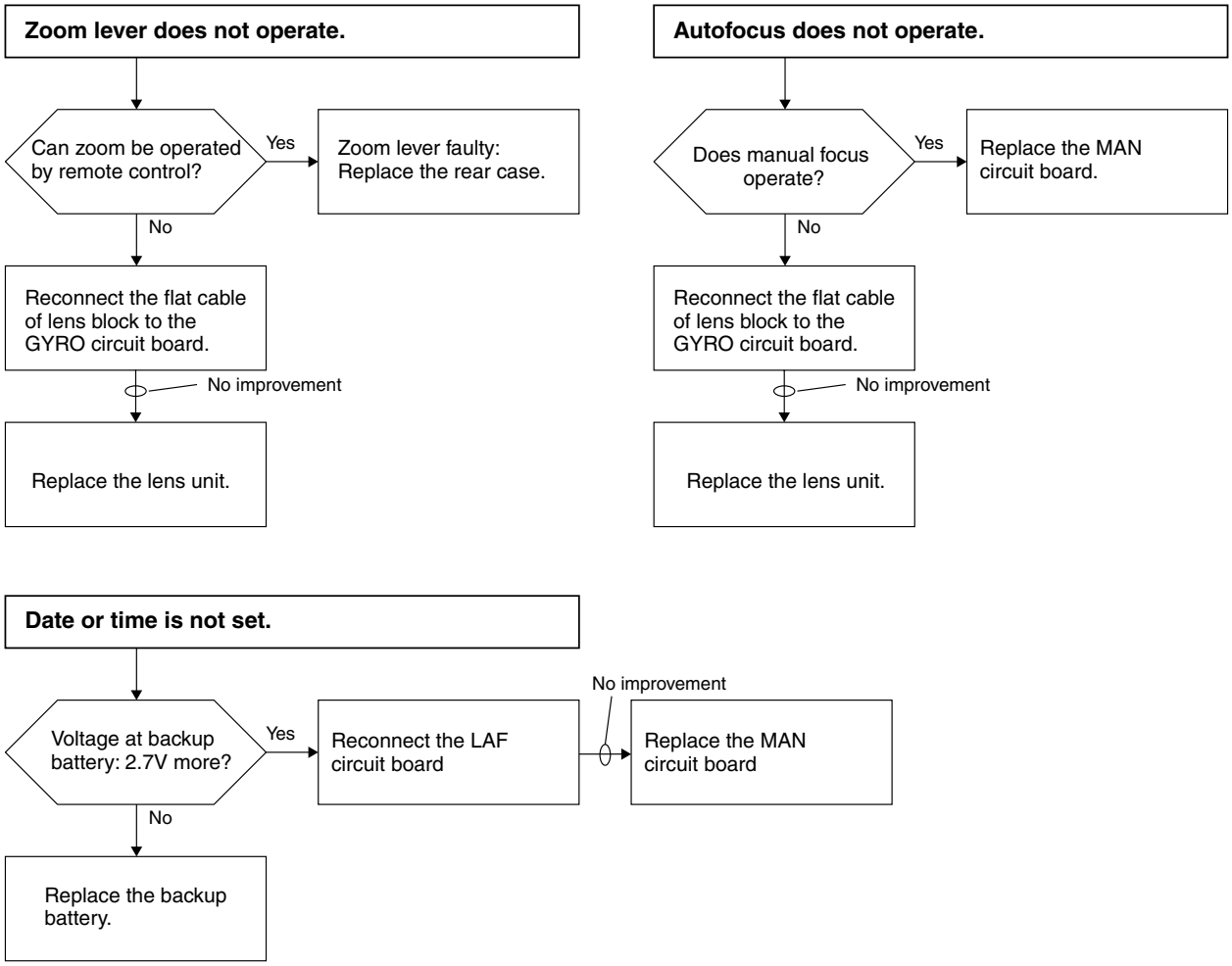
Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4822	AEL (B)	6C	Need
TP4845	AEL (B)	5C	Need

REC button does not operate.


Remove the MAN circuit board, and solder a lead wire to check points
Set to service position (A).
TP4003 (REC_KEY): 0V(*1)
No
REC button faulty: Replace the rear case.
Yes
*1: When REC button is pressed
Replace the MAN circuit board.

List of check points

Symptom	Circuit board (side)	Location on circuit board	Lead wire soldered or not
TP4003	MAN (A)	2F	Need


Zoom lever does not operate.
Can zoom be operated by remote control?
Yes
Zoom lever faulty: Replace the rear case.
No
Reconnect the flat cable of lens block to the GYRO circuit board.
No improvement
Replace the lens unit.
Autofocus does not operate.
Does manual focus operate?
Yes
Replace the MAN circuit board.
No
Reconnect the flat cable of lens block to the GYRO circuit board.
No improvement
Replace the lens unit.
Date or time is not set.
Voltage at backup battery: 2.7V more?
Yes
Reconnect the LAF circuit board
No improvement
Replace the MAN circuit board
No
Replace the backup battery.

4-5-2 Reassembly to enable service position

Cautions

1) The camcorder incorporates a high-voltage flash unit. Take electric shock prevention measures, such as wearing gloves, etc., and perform disassembly/reassembly with great care.
2) Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the camcorder before starting work.

Information:
Numbers in the procedural diagram are step numbers of procedure; letters in brackets [ ] show the types of screw.

(1) Setting to service position (A)

Service position (A) is used to troubleshoot the power supply system, video/audio signal system (excluding LCD monitor system) and operation button system on rear case side: Use the check points on the MAN and AEL circuit boards for troubleshooting.

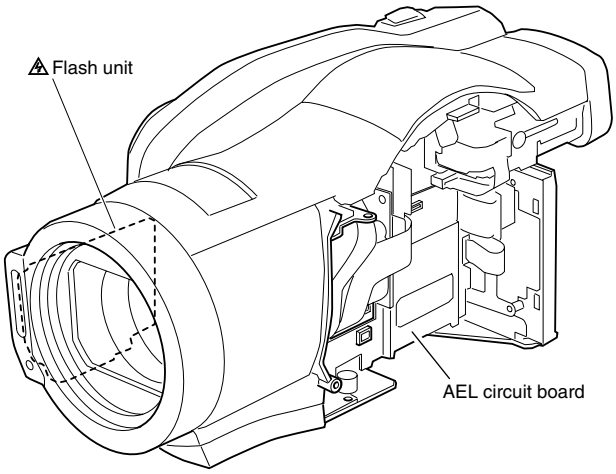


Fig. 4-5-1 Service Position (A)

Use the reverse procedure of removal to reattach the rear block, MAN circuit board, AEL circuit board, front block and top cover to the R block.
At this time, be sure to securely connect the MAN circuit board and BD drive unit, and also the MAN and AEL circuit boards.

(a) Rear block
(b) MAN circuit board
(c) AEL circuit board
(d) Front block
(e) Top cover
(f) R block
(g) BD drive unit
(h) MIC circuit board
(i) GYRO circuit board
(j) FRT circuit board

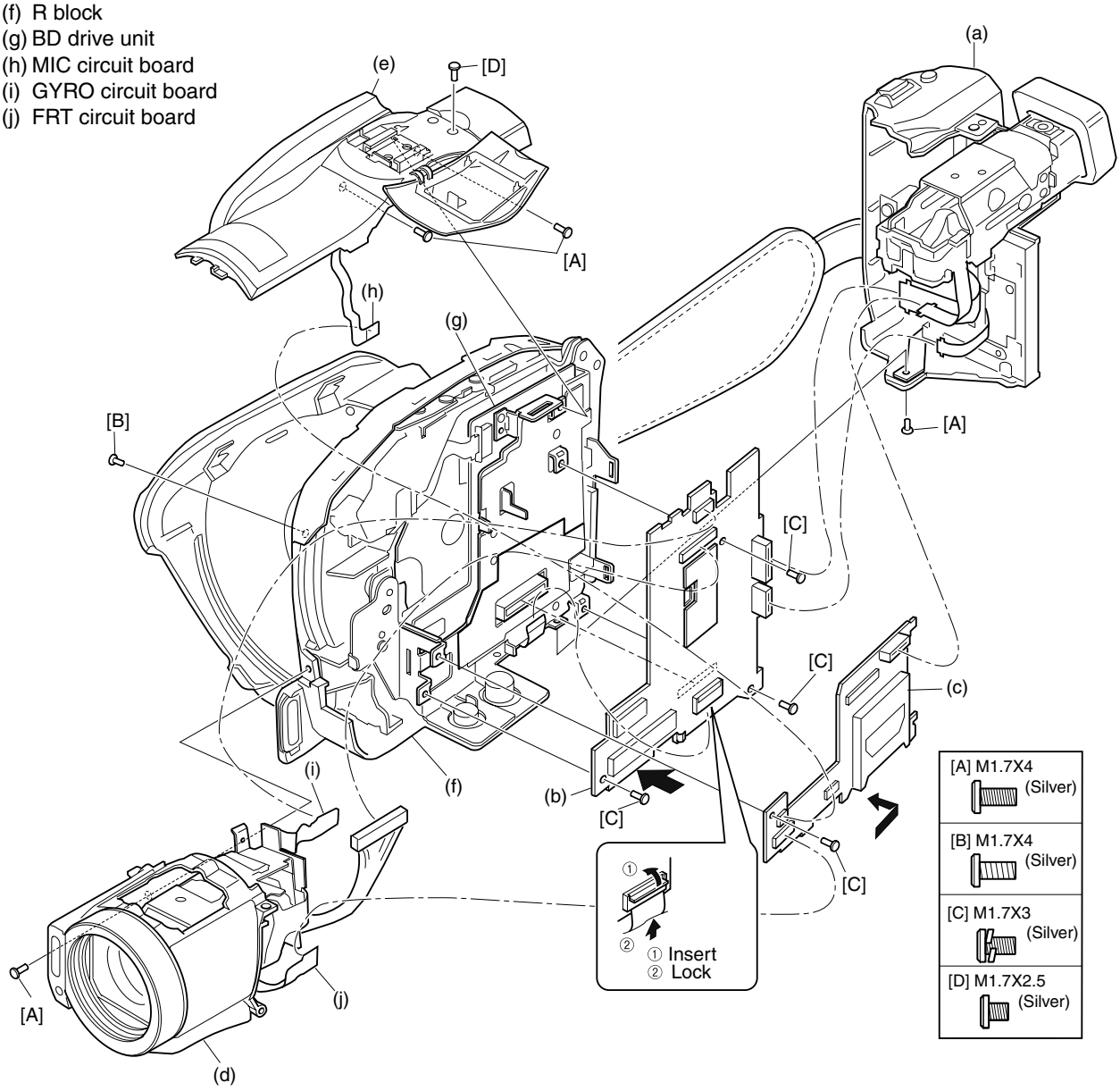


Fig. 4-5-2 Setting to Service Position (A)

(2) Setting to service position (B)

Service position (B) is used to troubleshoot the LCD monitor system and operation button system on L side case: Use the check points on MAN circuit board, AEL circuit board and EXL circuit board for troubleshooting.

1) Use the reverse procedure of removal to reattach the rear block, MAN circuit board, AEL circuit board, front block and top cover to the R block, and then set the camcorder to service position (B).
2) Connect the AEL and EXL circuit boards via the LAF circuit board.
3) Connect the USB circuit board in L block to the MAN circuit board.
4) Connect the AVS circuit board in L block to the AEL circuit board.

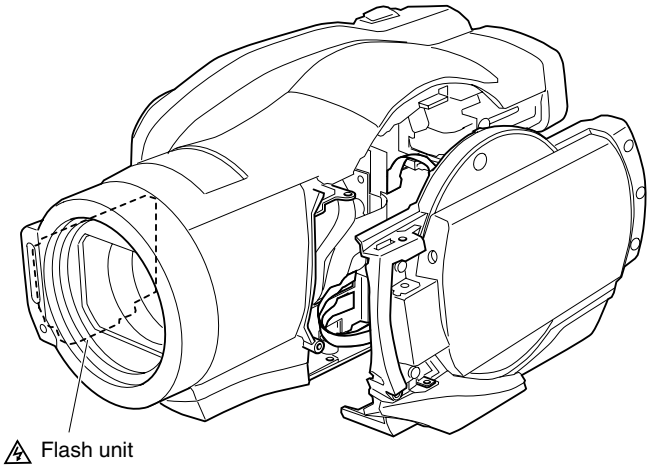


Fig. 4-5-3 Service Position (B)

(a) R block
(b) L block
(c) LAF circuit board
(d) USB circuit board
(e) AVS circuit board

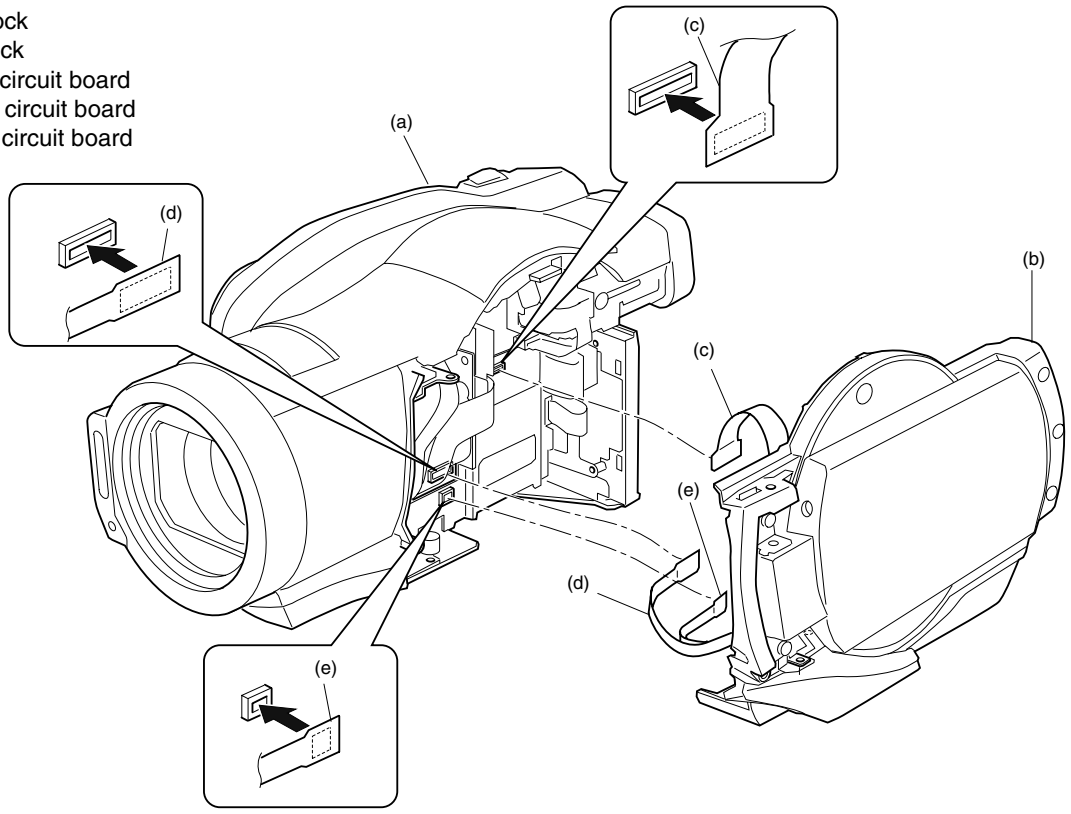


Fig. 4-5-4 Setting to Service Position (B)

4-6 Procedure for Removing BD/DVD from Faulty Camcorder

4-6-1 Items to be checked

Connect the AC adapter/charger or battery (power supply) to the camcorder, and set the power switch to "OFF": Make sure that the ACCESS indicator turns off, and then press the DISC EJECT button.

Even with a normal product, the BD/DVD cannot be removed while the ACCESS indicator is lit or blinking, or the HDD indicator is lit.

Information:

Be sure to connect the AC adapter/charger or charged battery pack (power supply) before pressing the DISC EJECT button.

The DISC EJECT button will not work unless a power supply is connected.

4-6-2 How to remove BD/DVD

If the BD/DVD cannot be removed after performing "4-6-1 Items to be checked", remove it using the procedure in this section.

Cautions

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the camcorder before starting work.

Information:

Numbers in the procedural diagram are step numbers of procedure, and letters in brackets [ ] show the types of screw.

1) Open the shoe cover (a) in the direction of the arrow.
2) Insert a fine-tipped flat-bladed screwdriver (d) into the groove in EJ cover (b), and remove the EJ cover in the direction of the arrow: Be very careful not to scratch the EJ cover or R case with screwdriver.
3) Use a fine-tipped flat-bladed screwdriver, etc. to move the lock slider (c) in the direction of the arrow, and then open the disc cover.
4) After removing the BD/DVD, close the disc cover.

(a) Shoe cover
(b) EJ cover
(c) Lock slider
(d) fine-tipped flat-bladed screwdriver

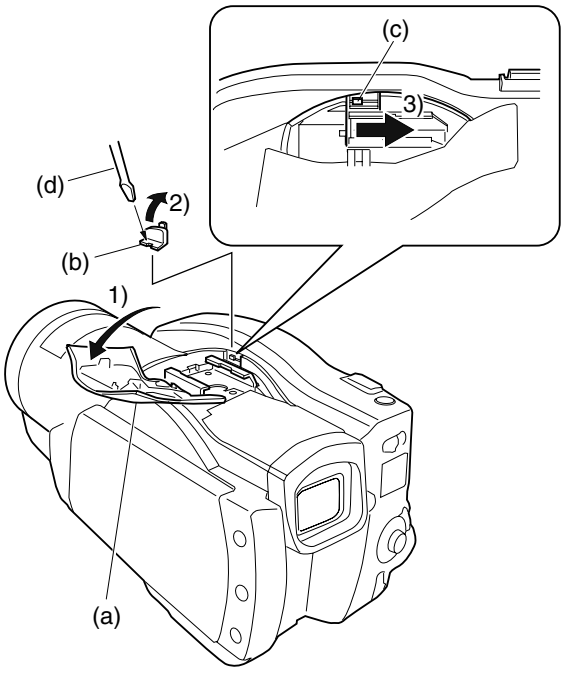


Fig. 4-6-1 How to remove BD/DVD

4-7 System Resetting/Resetting Camera Functions

The camcorder has two types of reset function: “System reset” and “Resetting camera functions”. The reset operation will return the various settings to the defaults when the camcorder was shipped form factory.

4-7-1 List of items to be reset

Table 4-7-1 shows the items that will be reset to defaults at the factory by the two types of reset operation: “system reset” and “resetting camera functions”. Check the settings of the received device. Use the memo column in the table to enter the settings of any received device.

(1) Procedure for checking settings

1) Set the power switch to “OFF” and use a battery or the AC adapter/charger to power the camcorder.
2) Set the Movie/Still switch to "Movie", insert a BD-R/BD-RE, and then turn the power switch to "ON". With the DZ-BD7HA, also use the power switch to choose the "BD/DVD" mode.
   Then operate the camcorder while watching the LCD monitor or viewfinder.
3) Press the MENU button to display the Camera Functions Setup screen, and then check the settings. Do not press the GUIDE button at this time: The settings cannot be confirmed.
4) Operate the joystick (⏮ / ⏭ / ◀◀ / ▶▶) to display the screens for the record function setup, output function setup, date function setup, EVF/LCD setup and initial setup, in sequence, and make sure of each setting.
   At this time, the menu items concerning the quality of movie recording on DVD and still recording will not appear: Check them in step 5) and after.
5) Remove the BD-R/BD-RE, and insert a DVD-RAM/DVD-RW/DVD-R.
6) Press the MENU button and operate the joystick to display the record function setup screen, and then check the setting of SD movie quality.
7) Set the Movie/Still switch to “Still”. It is not necessary to insert a card at this time.
8) Press the MENU button to display the camera Function setup screen, and then check the flash setting.
9) Operate the joystick to display the record function setup screen, and then check the setting of self timer.
10) After checking is complete, press the STOP/EXIT or MENU button to restore the ordinary screen.

Yes: Will be reset

Table 4-7-1 List of items to be reset

No: Will not be reset

Item	System reset	Camera function reset	Default at factory	Setting range	Remarks	Memo
Camera Functions Setup						
Program AE	Yes	Yes	Auto	Auto, Portrait, Spotlight, Sand & Snow, Low Light		
White Balance	Yes	Yes	Auto	Auto, Set, Outdoor, Indoor		
EIS	Yes	Yes	On	On, Off	Displayed only in the BD/DVD or HDD mode.	
Digital Zoom	Yes	Yes	40x	500x, 40x, Off		
MIC Filter	Yes	Yes	Off	On, Off		
Flash	Yes	Yes	Auto	Auto, On, Off	Displayed only in the SD mode.	
Auxiliary Line	Yes	Yes	Off	On, Off		
Record Functions Setup						
HD Video Mode	Yes	Yes	HX	HX, HF, HS	Displayed only in the BD or HDD mode.	
SD Video Mode	Yes	Yes	SF	SX, SF	Displayed only in the DVD mode.	
Self Timer	Yes	Yes	Off	On, Off	Displayed only in the SD mode.	
Output Function Setup						
Component output	Yes	Yes	D3	D3, D1		
Date Setup						
Date Set	Yes	No	1/1/2007 12:00 AM	----------		
Date Mode	Yes	Yes	M/D/Y	5:00PM M/D/Y, 17:00 D/M/Y, PM5:00 Y/M/D		
LCD/EVF Setup						
LCD Brightness	Yes	Yes	Center			
EVF Brightness	Yes	Yes	Center			
Color Level	Yes	Yes	Center			
EVF Display	Yes	Yes	Auto	Auto, On		
Initial Setup						
Beep	Yes	Yes	On	On, Off		
Power Save	Yes	Yes	Off	On, Off		
Record LED	Yes	Yes	On	On, Off		
Language	Yes	Yes	English	English, French, Spanish, German, Italian		
Demo Mode	Yes	Yes	Auto	Auto, Off, Start		

4-7-2 System reset procedure

Note:
Always perform system reset after completing repair: System reset will erase all error codes stored in flash memory.

1) Set the power switch to “OFF”, and then disconnect the battery or AC adapter/charger.
2) Use a fine tipped pen, etc. to push the RESET button.

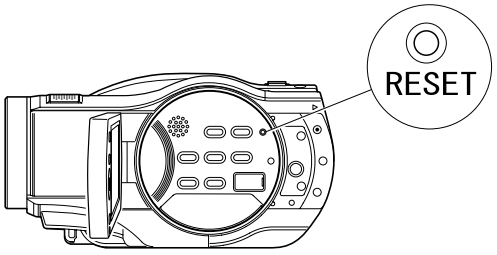


Fig 4-7-2 Reset switch position

4-7-3 Procedure for resetting camera functions

1) Connect a battery or AC adapter/charger to power the camcorder.
2) Set the Movie/Still switch to “Still”, and then turn the power switch to “ON”. It is not necessary to insert a card at this time. For the following steps, operate camcorder while viewing the LCD monitor or viewfinder.
3) Press the MENU button to display the camera function setup screen.
4) Use the joystick (⏮ / ⏭ / ◀◀ / ▶▶) to choose "Initial Setup", and then press the center button of joystick.
5) Operate the joystick to choose "Reset", and then press the center button of joystick: The Reset confirmation screen will appear.
6) Use the joystick to choose "YES", and then press the center button of joystick: Reset will be executed.
7) After reset, press the STOP/EXIT or MENU button to close the camera function setup screen.

5 Disassembly and Reassembly

Note:
Even if the shapes of parts are different, the following disassembly procedure, using the DZ-BD7HA, is the same for all models.

5-1 Items to Be Checked

(1) Checking Disc

Connect the AC adapter/charger or battery to the camcorder, and set the power switch to "OFF". Then press the DISC EJECT button and make sure that no disc is loaded. After checking, close the disc insertion block.

If the disc insertion block does not open using the above procedure, perform the following procedure:

1) Open the Shoe cover (a) in the direction of the arrow.
2) Insert a fine-tipped flat-bladed screwdriver (d) into the groove in EJ cover, and remove the EJ cover (b) from Top cover in the direction of the arrow.
3) Use a fine-tipped flat-bladed screwdriver, etc. to move the lock slider (c) in the direction of the arrow to open the disc insertion block.
   After checking, close the disc insertion block.

(a) Shoe cover
(b) EJ cover
(c) Lock slider
(d) Fine-tipped flat-bladed screwdriver

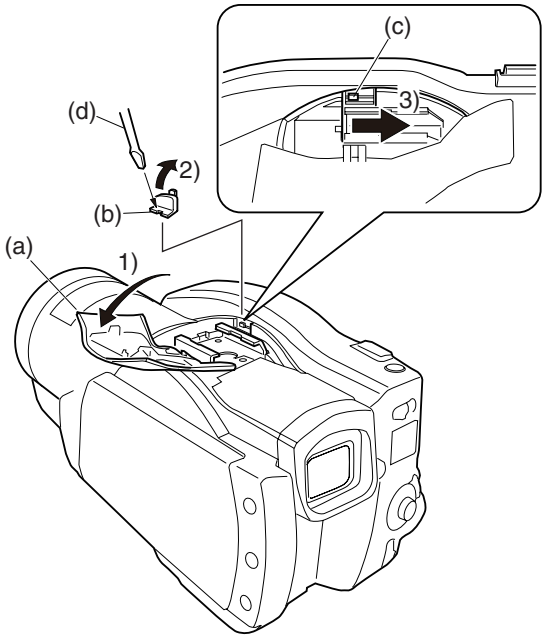


Fig. 5-1-1 How to open the disc insertion block

(2) Checking Card

Make sure that no card is loaded in the card slot, and then, close the card slot cover.

Caution

Laser light striking the eye may cause your eyesight to be lost: For safety, be sure to remove any power supply (AC adapter/charger, battery, etc.) from the camcorder before starting work.

5-2 Order of Disassembly and Names of Major Circuit Boards and Units

5-2-1 Order of Disassembly

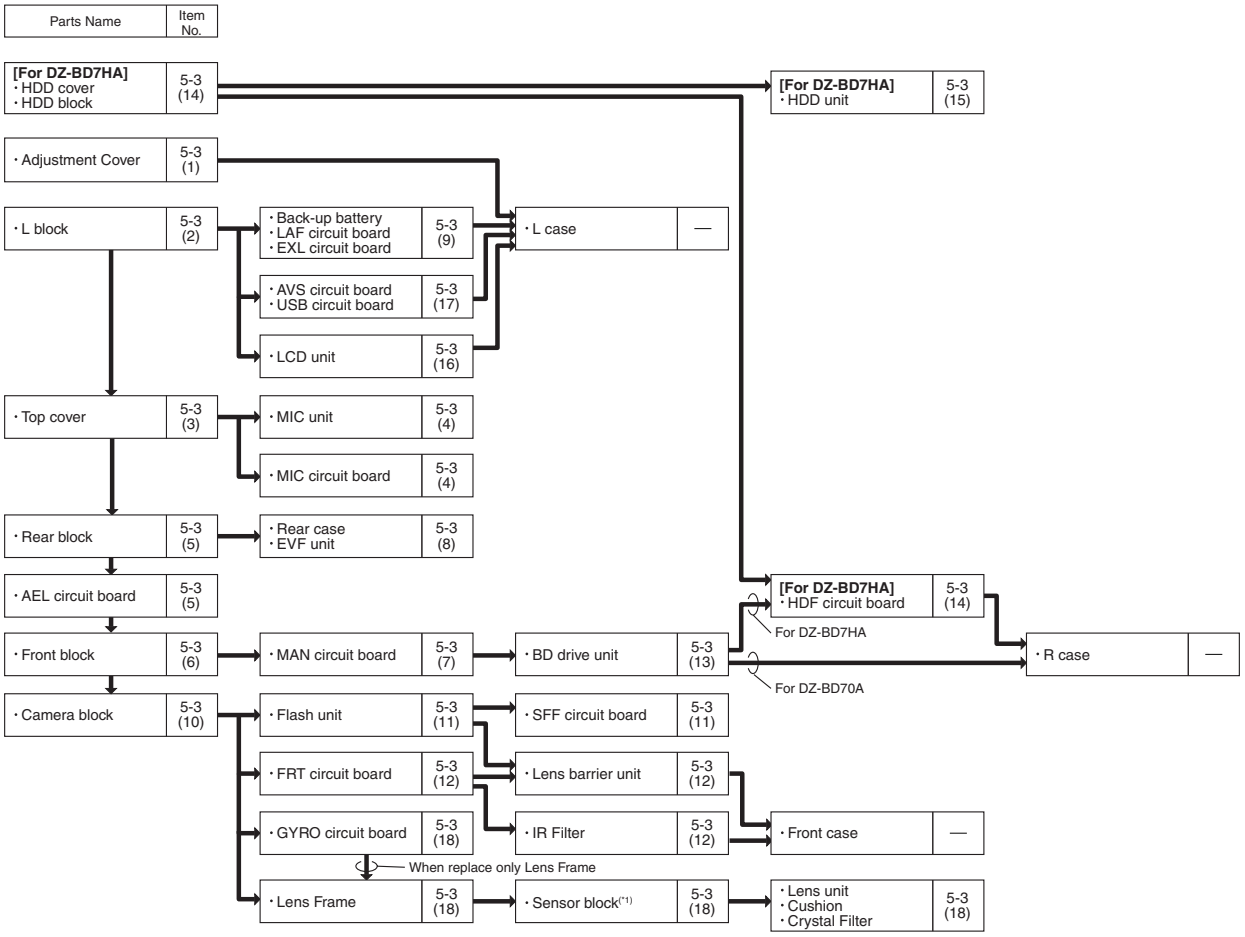
1) Refer to the disassembly flowchart in Figs. 5-2-1 for the order of removing each component. Unless otherwise specified, use the reverse procedure to reassemble the removed components.

Note:
When replacing components, be sure to use only those shown in “Replacement Parts List”.

Reading Disassembly Flowchart:

After locating the target component in the flowchart, remove all components in sequence until the target is reached, following the arrows (routes) from the top left of flowchart. If multiple routes exist to the target component from the top of flowchart, remove all the components on all the routes.

Disassembly Flowchart



*1:The sensor block comprises the 5MCMOS circuit board assembly on which the sensor is mounted.

Fig. 5-2-1 Disassembly Flowchart

5-2-2 Names of Major Circuit Boards and Units

(a) BD drive unit
(b) EVF unit
(c) Flash unit
(d) HDD unit [For DZ-BD7HA]
(e) LCD unit
(f) Lens unit
(g) 5MCMOS circuit board
(h) AEL circuit board
(i) AVS circuit board
(j) EXL circuit board
(k) FRT circuit board
(l) GYRO circuit board
(m) HDF circuit board [For DZ-BD7HA]
(n) LAF circuit board
(o) MAN circuit board
(p) MIC circuit board
(q) SFF circuit board
(r) USB circuit board

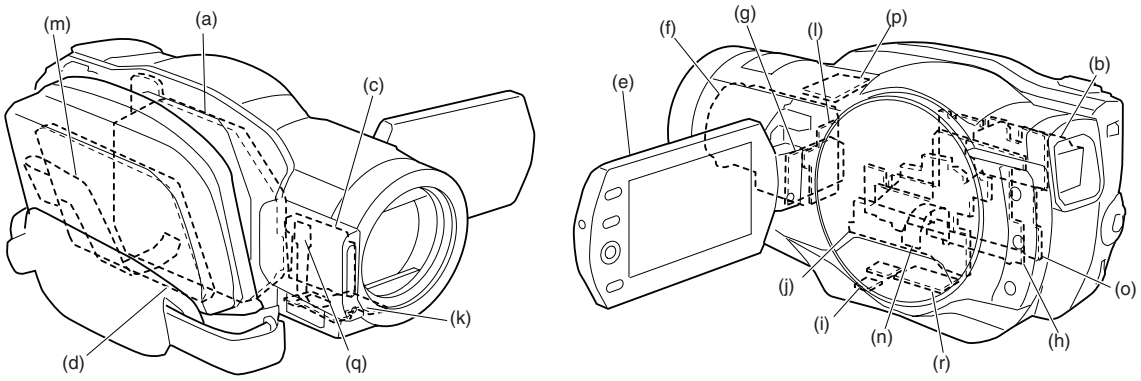


Fig. 5-2-2

5-3 Disassembly

Information:
Numbers in the disassembly procedure diagrams are step numbers of disassembly procedures, and letters in brackets [ ] show the types of screw.

(1) Adjustment Cover

1) Open the LCD monitor section (b) in the direction of the arrow.
2) Insert a fine-tipped flat-bladed screwdriver (c) into the groove in adjustment cover (a), and remove the cover from L case (d) in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver.

(a) Adjustment cover
(b) LCD monitor section
(c) Fine-tipped flat-bladed screwdriver
(d) L case

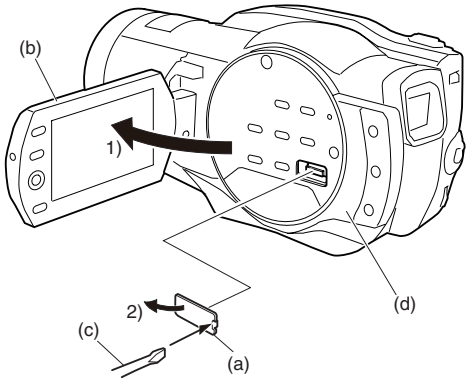


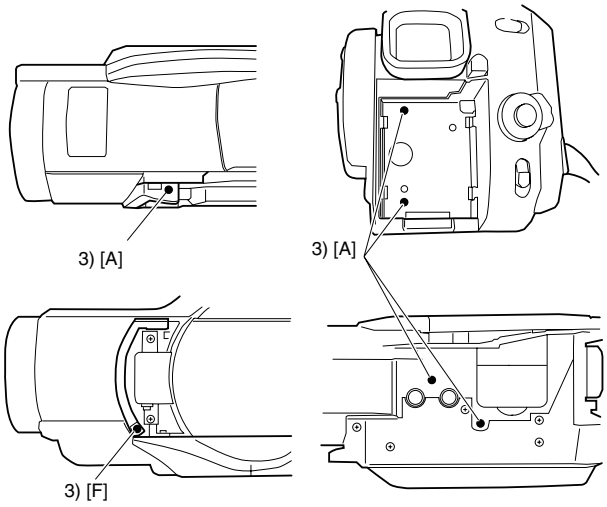
Fig. 5-3-1

(2) L Block

1) Remove the screw [A] and then remove the L cover (a) in the direction of the arrow.
2) Open the Shoe cover (b) in the direction of the arrow and then remove the screw [B].
3) Remove the screw [F] and the five screws [A].
4) Open the L block (c) in the direction of the arrow from the rear side.
   The tab of the L block is engaged with the top cover (d) at this time, so take care not to damage it.
   Also take care that circuit boards LAF (f), USB (g) or AVS (h) between the L and R blocks are not disconnected.
5) Remove the LAF circuit board.
6) Remove the AVS circuit board.
7) Remove the USB circuit board.

Caution during disassembly and reassembly:

1) Securely plug the LAF circuit board and AVS circuit board into the AEL circuit board (i).
2) Securely plug the USB circuit board into the MAN circuit board (j).



Detailed view of screw positions

(a) L cover
(b) Shoe cover
(c) L block
(d) Top cover
(e) R block
(f) LAF circuit board
(g) USB circuit board
(h) AVS circuit board
(i) AEL circuit board
(j) MAN circuit

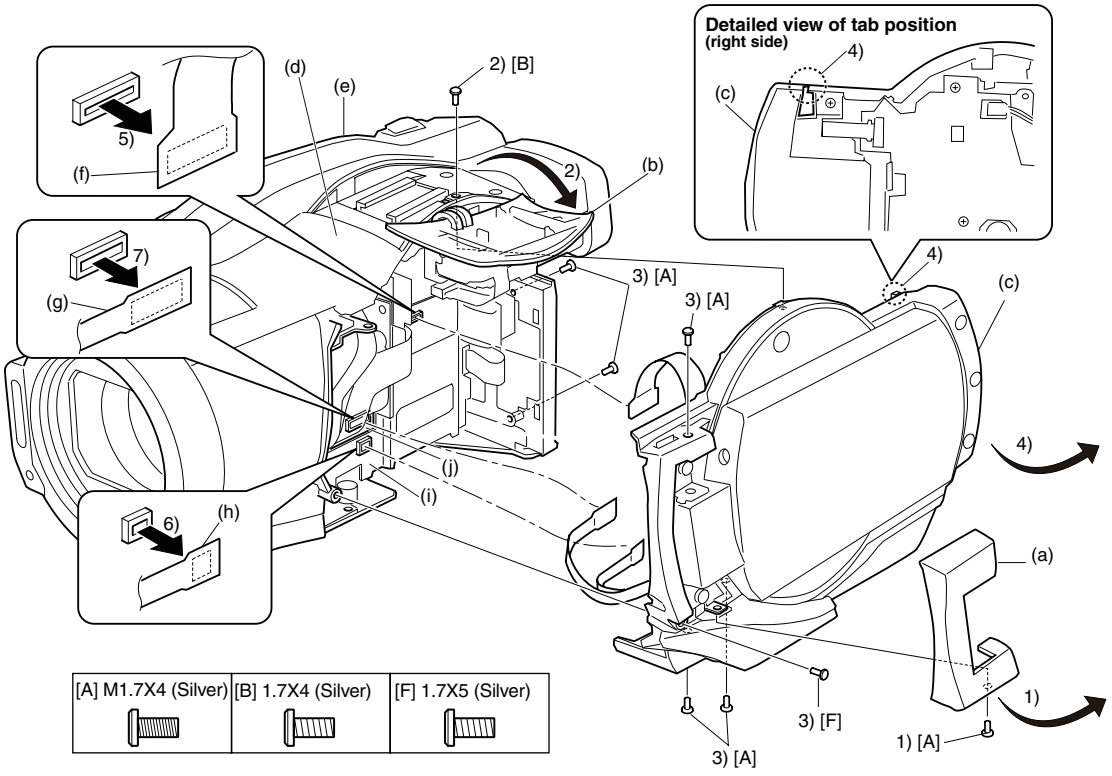


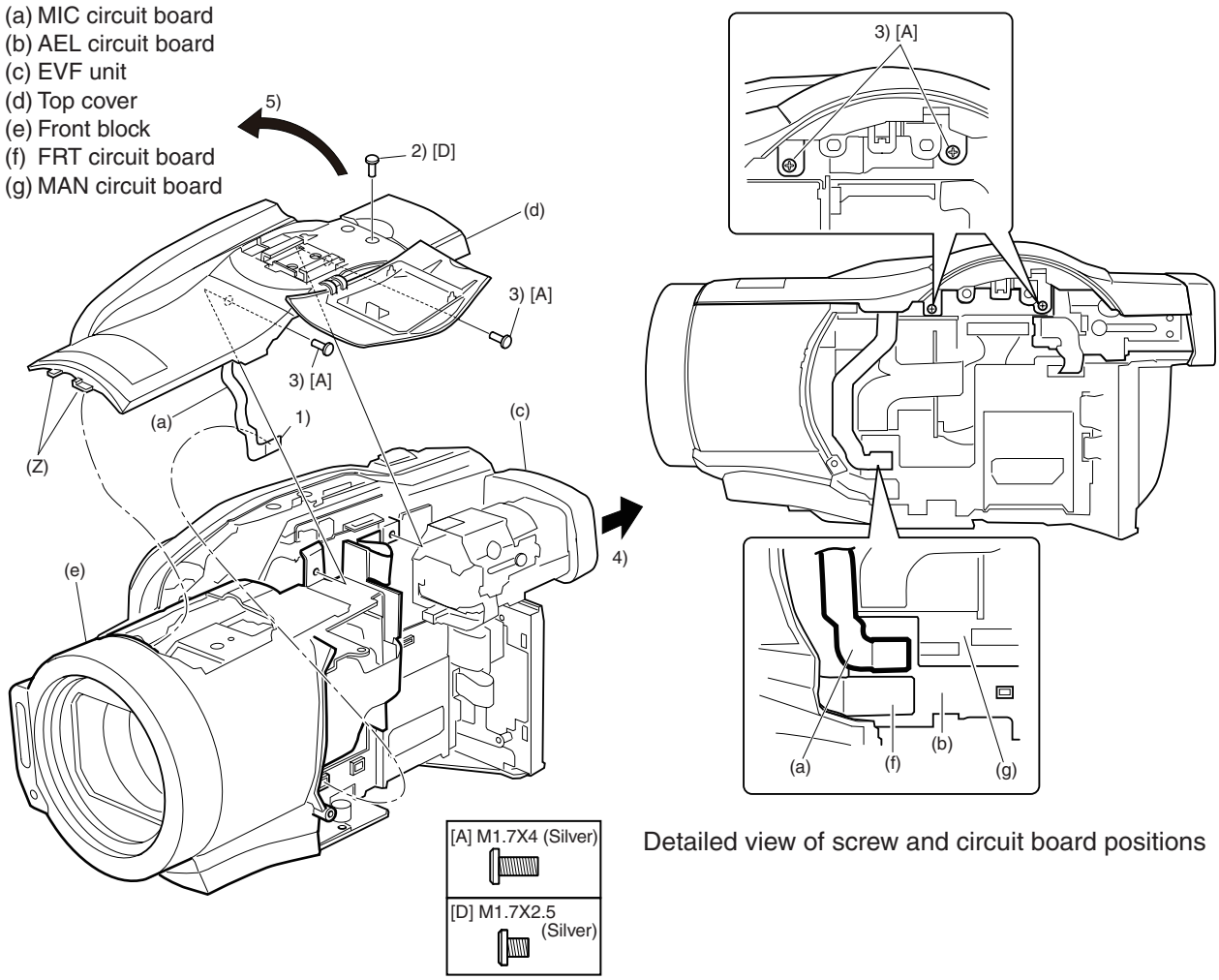
Fig. 5-3-2

(3) Top Cover

1) Remove the MIC circuit board (a) into the AEL circuit board (b).
2) Remove the screw [D].
3) Remove the two screws [A].
4) Pull out the EVF unit (c) in the direction of the arrow.
5) Remove the Top cover (d) in the direction of the arrow.

Caution during disassembly and reassembly:

Insert tabs (Z) of the top cover into the front block (e), and then reassemble the top cover.



Detailed view of screw and circuit board positions

Fig. 5-3-3

(4) MIC circuit board and MIC unit

1) Disconnect the flat cable of the MIC unit (a).
2) Remove the screw [B], and then remove the MIC circuit board (b).
3) Remove the two screws [B].
4) Remove the MIC unit in the direction of the arrow.

Caution during disassembly and reassembly:

1) Connect the flat cables to the same positions of the MIC circuit board as those during disassembly.
2) When replacing the MIC unit, paste the ground sheet (d) so that the tab (c) of MIC cover can be connected to the MIC unit.
3) The ground sheet cannot be reused: Purchase new one for reassembly.

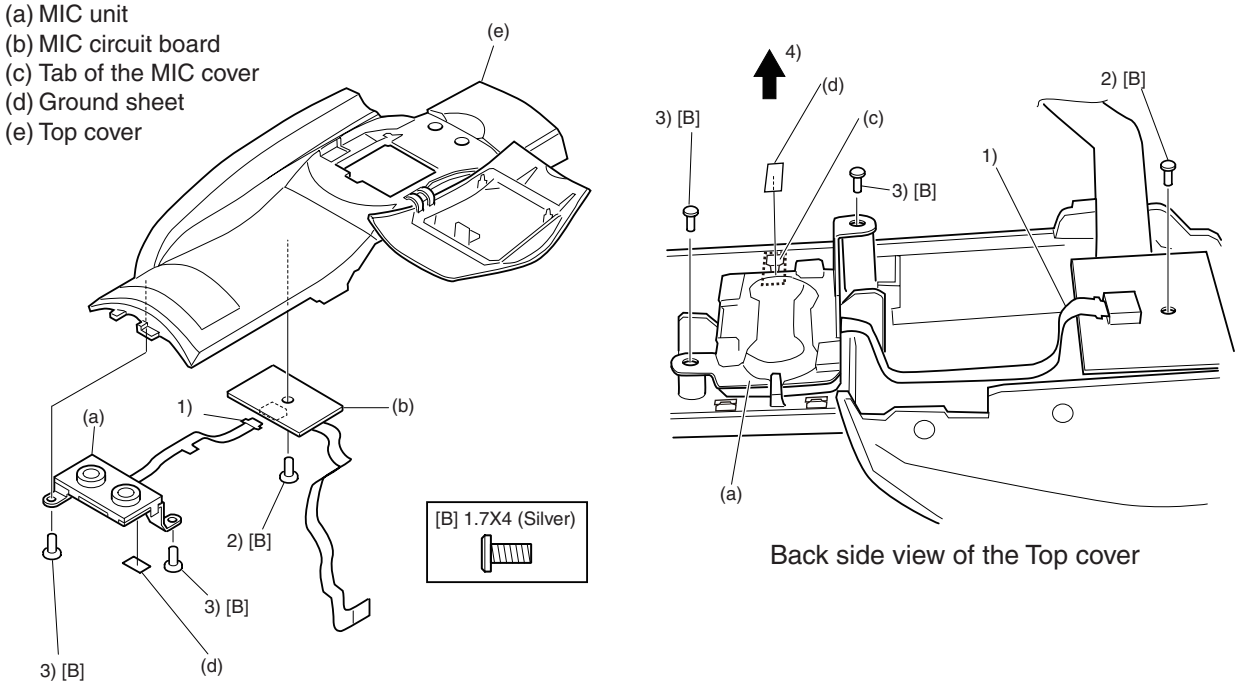


Fig. 5-3-4

(5) Rear Block and AEL Circuit Board

1) Remove the hand strap (a) from R case (b).
2) Disconnect the two flat cables of the Rear block (c).
3) Disconnect the flat cable of the EVF unit (d).
4) Remove the screw [A], and then remove the Rear block in the direction of the arrow.
5) Remove the FRT circuit board (e) from AEL circuit board (f).
6) Remove the screw [C], and then remove the AEL circuit board from MAN circuit board (g).
   The AEL circuit board may touch the cable of lens block at this time: Be careful not to damage the cable.

Caution during disassembly and reassembly:

1) Insert the projection (X) of AEL circuit board into position (X'), and the projection (Y) into position (Y'), then plug in the connector.
2) Securely connect the AEL circuit board and the MAN circuit board.

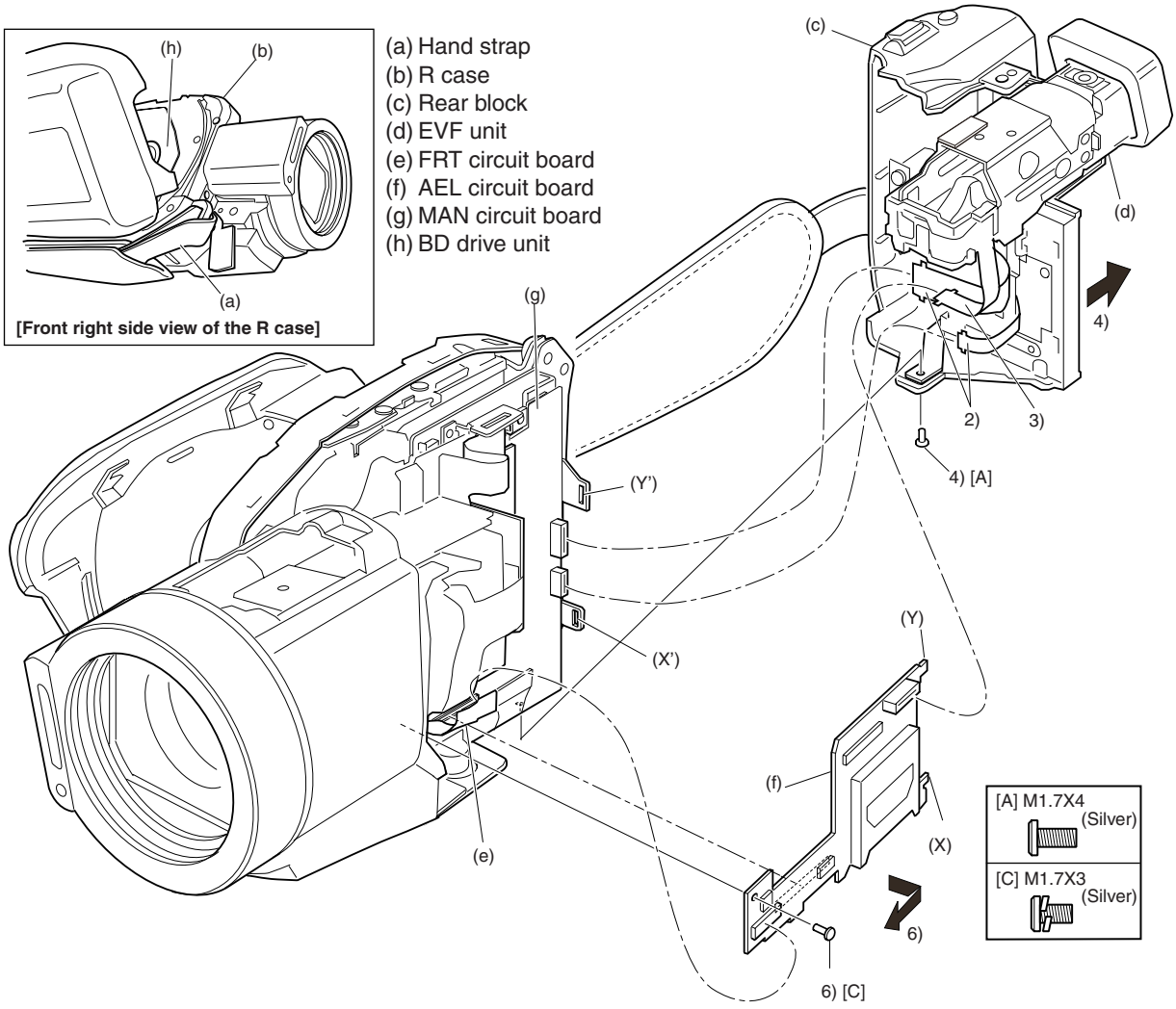


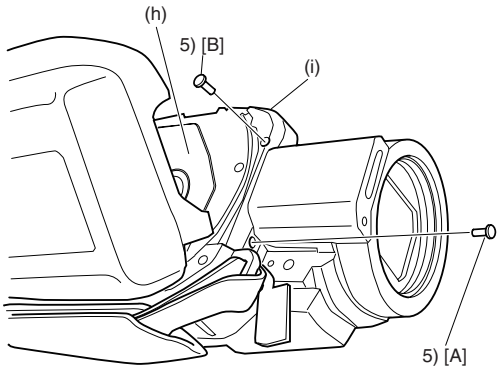
Fig. 5-3-5

(6) Front Block

Caution

The front block of DZ-BD7HA and DZ-BD70A incorporates a high-voltage flash unit.
Do electric shock prevention measures, such as wearing gloves, and take great care during work.

1) Remove the GYRO circuit board (a) from MAN circuit board (b).
2) Remove the Busteraid [A] (c) on the connector (d).
3) Disconnect the connector from MAN circuit board.
4) Move the lock slider (e) in the direction of the arrow to open the disc insertion block.
5) Remove the screw [A] and the two screws [B].
6) Remove the front block (f) in the direction of the arrow.



Front right side view of the R case

Caution during disassembly and reassembly:
Using the Busteraids [A] and [B] sandwich the connector when reconnecting it.

(a) GYRO circuit board
(b) MAN circuit board
(c) Busteraid [A]
(d) Connector
(e) Lock slider
(f) Front block
(g) Busteraid [B]
(h) BD drive unit
(i) R case

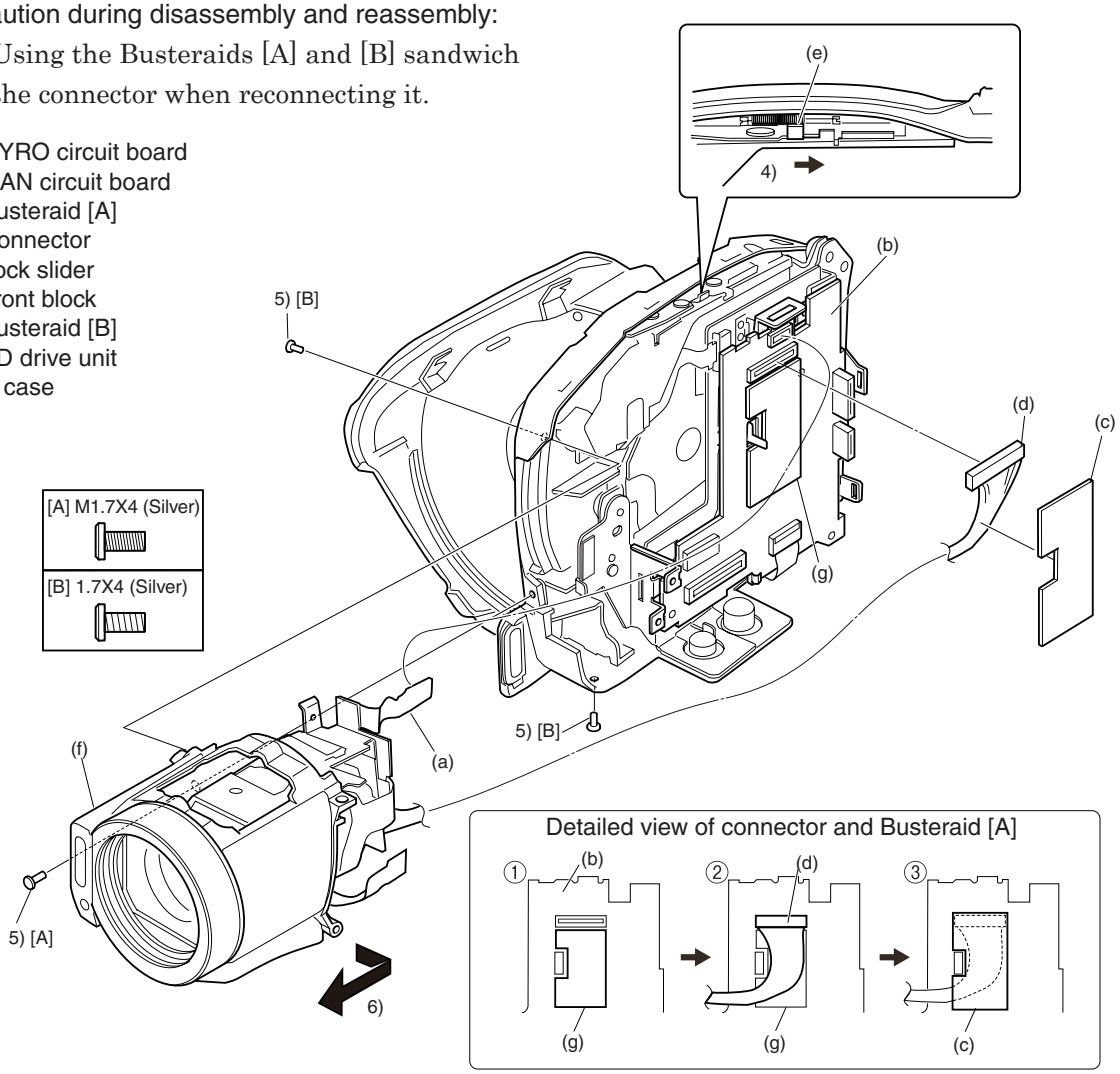


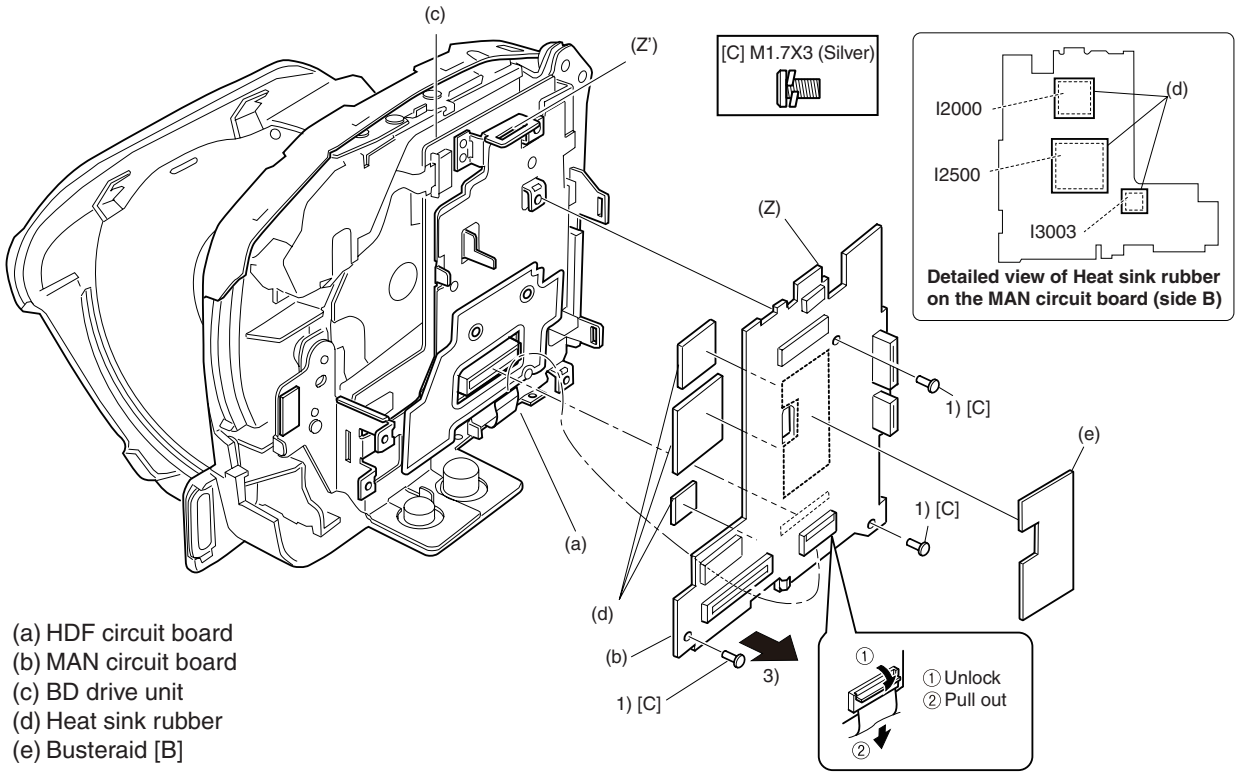
Fig. 5-3-6

(7) MAN Circuit Board

1) Remove the three screws [C].
2) Disconnect the HDF circuit board (a) from MAN circuit board (b).
3) Remove the MAN circuit board, respectively, in the directions of the arrows. The MAN circuit board is directly connected to a circuit board on the BD drive unit (c) via connector, so be sure to remove it in the direction of the arrow.

Caution during disassembly and reassembly:

1) Insert the hook (Z) of MAN circuit board into portion (Z'), and then plug in the connector.
2) Securely connect the MAN circuit board and the circuit board on BD drive unit.
3) Be sure to paste the three heat sink rubbers (d): Neglecting this could cause a fault.
4) After replacing the MAN circuit board, paste the Busteraid [B] to the specified position.



(a) HDF circuit board
(b) MAN circuit board
(c) BD drive unit
(d) Heat sink rubber
(e) Busteraid [B]

Fig. 5-3-7

(8) Rear Case and EVF Unit

1) Pull out the EVF unit (b) in the direction of the arrow.
2) Remove the eye cup (c) in the direction of the arrow.
3) Remove the screw [A].

Caution during disassembly and reassembly:

When replacing the EVF unit paste the gasket (d) to the specified position.

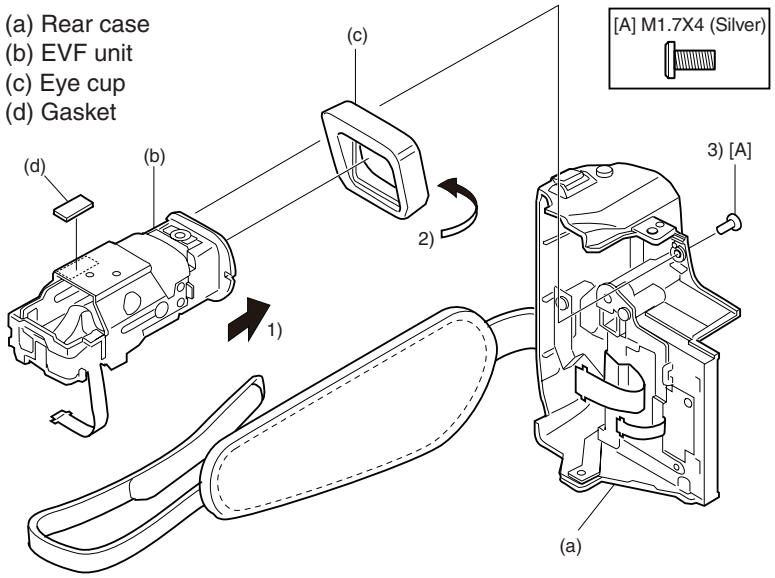


Fig. 5-3-8

(9) Back-up Battery, LAF Circuit Board and EXL Circuit Board

1) Use tweezers, etc. to remove the backup battery (a) in the direction of the arrow. Take care not to damage the battery holder (b) on EXL circuit board (c) at this time.
2) Remove the LAF circuit board (d) in the direction of the arrow.
3) Remove the three connectors.
4) Remove the four screws [B], and then remove the EXL circuit board.

Caution during disassembly and reassembly:

Attach the backup battery making sure that the positive (+) terminal is visible.

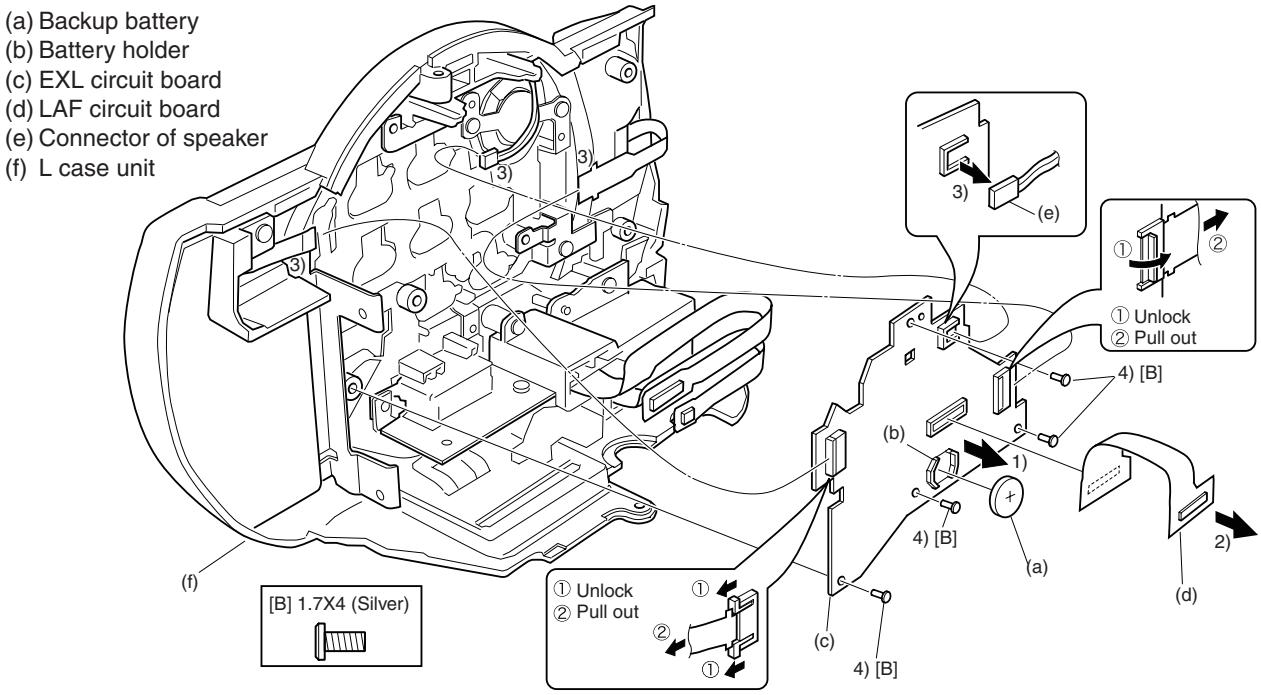


Fig. 5-3-9

(10) Camera Block

Caution

The front block of DZ-BD7HA and DZ-BD70A incorporates a high-voltage flash unit.
Do electric shock prevention measures, such as wearing gloves, and take great care during work.

1) Remove the screw [C] and ground cable [A] (a) of FRT circuit board (c).
2) Remove the screw [B] and ground cable [B] (b) of Flash unit (d).
3) Remove the screw [A].
4) Remove the Camera block (e) from Front block (f) in the direction of the arrow.

Caution during disassembly and reassembly:

Attach the ground cable [A] from flash unit, and the ground cable [B] from FRT circuit board to the specified positions.

Note:

Take great care when handling the camera block: The camera block contains the lens unit, which is a precision component. Subjecting the lens unit to any impact, however slight, could result in a fault.

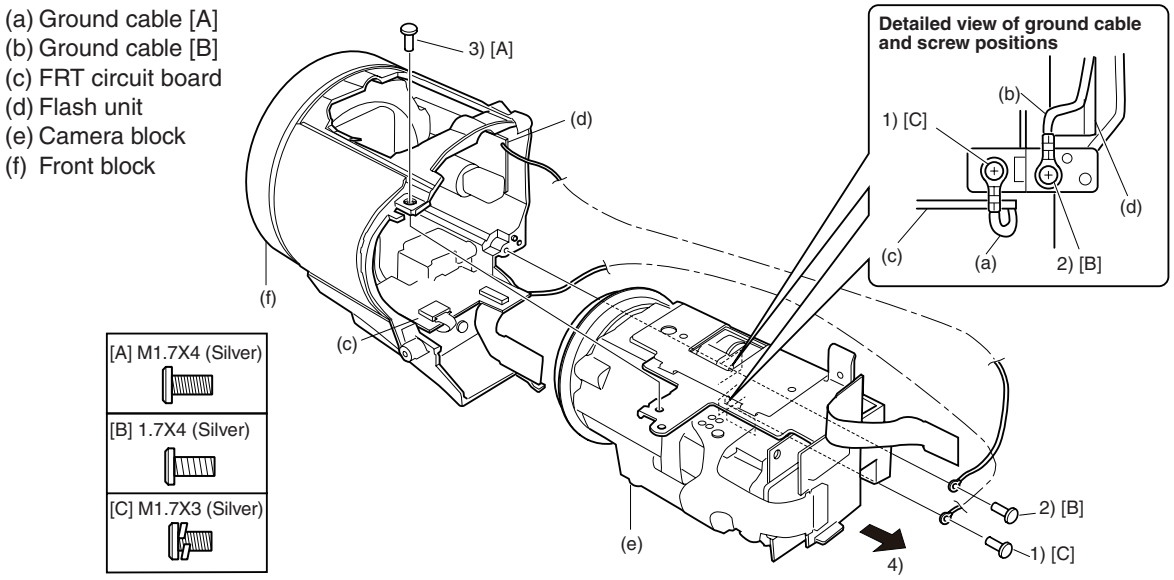


Fig. 5-3-10

(11) Flash Unit and SFF Circuit Board

Caution

The flash unit has a high-voltage circuit: Do electric shock prevention measures, such as wearing gloves, and take great care during work.

1) Remove the SFF circuit board (a) from FRT circuit board (b).
2) Remove the screw [B].
3) Remove the flash unit (c) from front block (d) in the direction of the arrow.
4) Remove the SFF circuit board from flash unit.

(a) SFF circuit board
(b) FRT circuit board
(c) Flash unit
(d) Front block

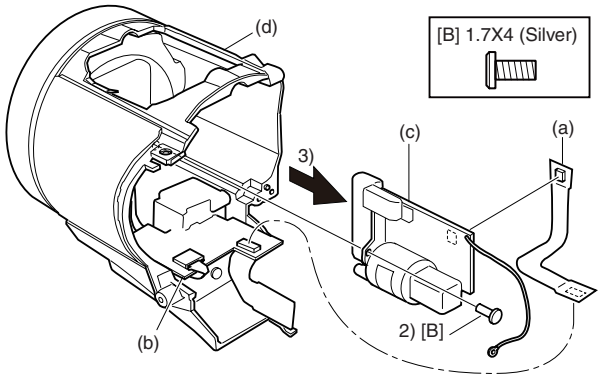


Fig. 5-3-11

(12) FRT Circuit Board, Lens Barrier Unit and IR Filter

1) Remove the flat cable of lens barrier unit (a) from FRT circuit board (b).
2) Move the jack cover (c), and then remove the screw [B].
3) Remove the FRT circuit board in the direction of the arrow.
4) Remove the two tabs of jack holder (d), and then remove the jack holder (e).
5) Remove the three screws [B].
6) Remove the lens barrier unit (f) in the direction of the arrow.
7) Remove the screw [B], and then remove the IR filter (g).

Caution during disassembly and reassembly:

Reconnect the flat cable to the same position of FRT circuit board as that during disassembly.

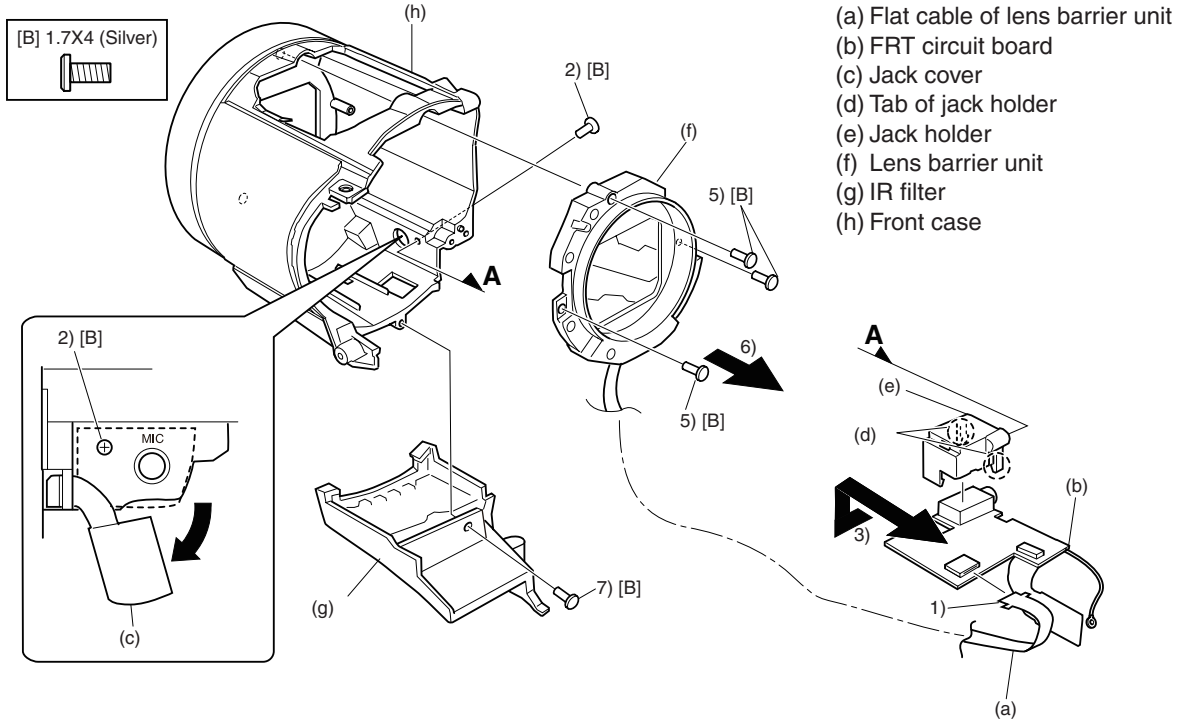


Fig. 5-3-12

(13) BD Drive Unit

1) Disconnect the flat cable.
2) Remove the screw [A].
3) Remove the two screws [B], and then remove the BD drive unit (a).

Note:
The BD drive unit is a precision component: Take great care when handling it. Do not subject the BD drive unit to any impact: Doing so could cause a fault.

Caution during disassembly and reassembly:

1) Be sure to paste the heat sink rubber (c): Neglecting this could cause a fault
2) When replacing the BD drive unit paste the graphite sheet (d) and the gasket (e) to the specified position.
3) The graphite sheet cannot be reused: Purchase new one for reassembly.

(a) BD drive unit
(b) R case
(c) Heat sink rubber
(d) Graphite sheet
(e) Gasket

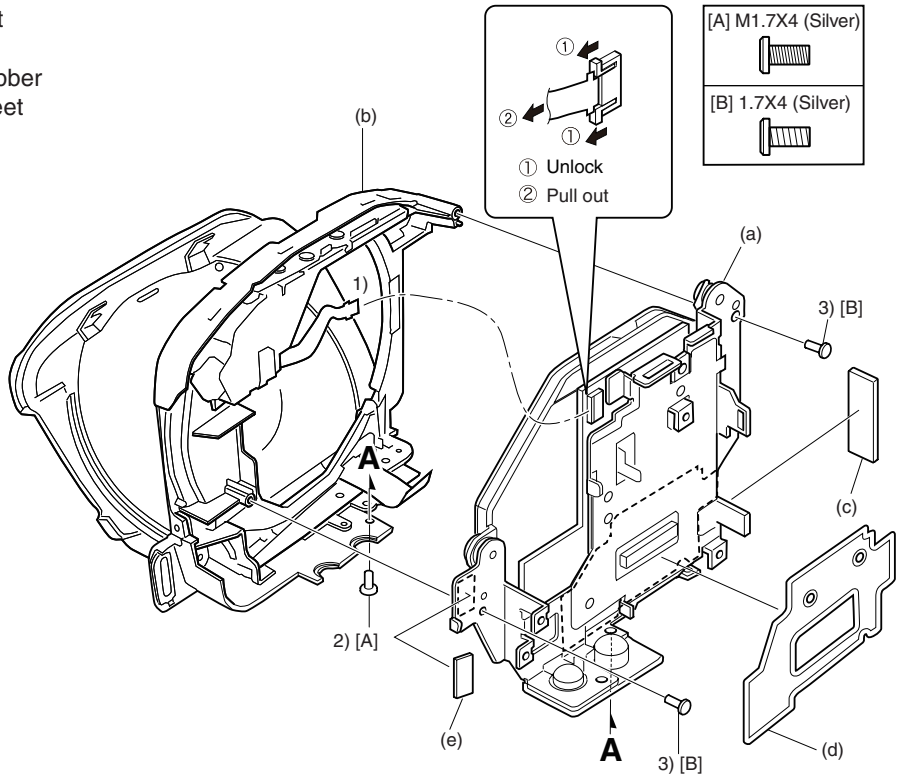


Fig. 5-3-13

(14) HDD Cover, HDD Block and HDF Circuit Board [For DZ-BD7HA]

Information:

The HDD cover and HDD block can be replaced without removing any other components: Perform steps 1) – 8) below after opening the disc insertion block using the procedure shown in "5-1 Items to Be Checked".

Note:

The HDD unit in a HDD block is a very delicate device, extremely susceptible to vibration or impact: Handle it with care, referring to "1-4 Cautions when Handling 1.8-inch HDD (Hard Disk Drive) for Hybrid/BD Camcorder".

1) Remove the screw [B].
2) Move the lock slider (a) in the direction of the arrow to open the disc insertion block.
3) Remove the screw [B].
4) Move the HDD cover (b) approx. 4 mm from the R case (c) in the direction of the arrow.
5) Insert a fine-tipped flat-bladed screwdriver (d) into the hole in the R case, and release the tab of HDD cover (g) in the direction of the arrow: Take care not to scratch the HDD cover or R case at this time.
6) Remove the HDD cover in the direction of the arrow. Make sure at this time that neither the HDD cushions (e) nor HDD block (f) is attached to the HDD cover. If they are attached to the HDD cover, remove them before removing the HDD cover.

(a) Lock slider
(b) HDD cover
(c) R case
(d) Fine-tipped flat-bladed screwdriver
(e) HDD cushion
(f) HDD block
(g) Tab of HDD cover
(h) HDF circuit board
(i) Plate spring

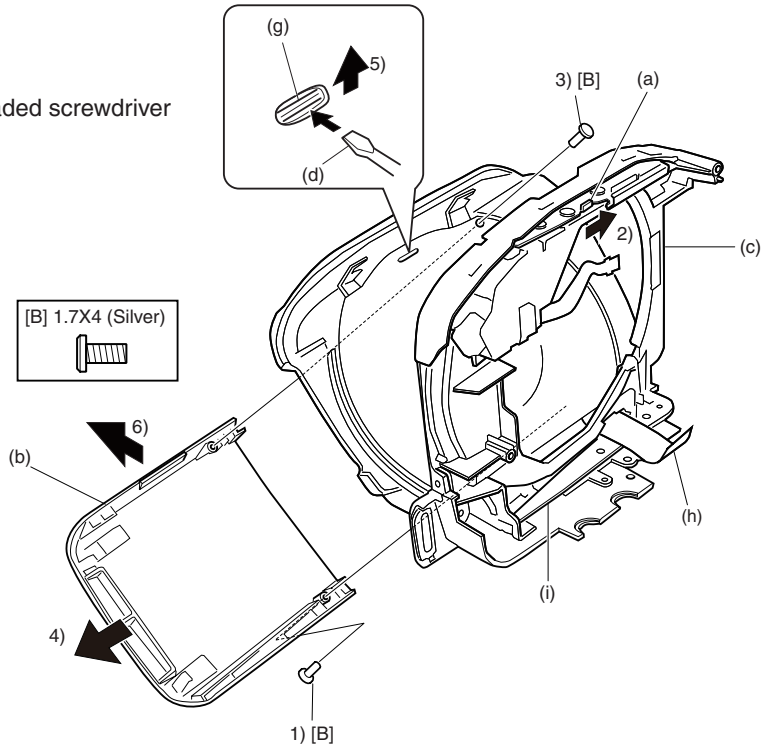


Fig. 5-3-14A

7) Disconnect the HDF circuit board (h) from HDD block.
8) Remove the HDD block from the R case in the direction of the arrow.
9) Pull out the HDF circuit board in the direction of the arrow to remove it from R case.

Procedure for reassembly/caution

1) Be sure to reassemble the HDF circuit board so that it passes under the plate spring: Failure to do so could cause a fault, including wire disconnection.
2) When replacing the R case paste the gasket (j) to the specified position.

(c) R case
(f) HDD block
(h) HDF circuit board
(j) Gasket

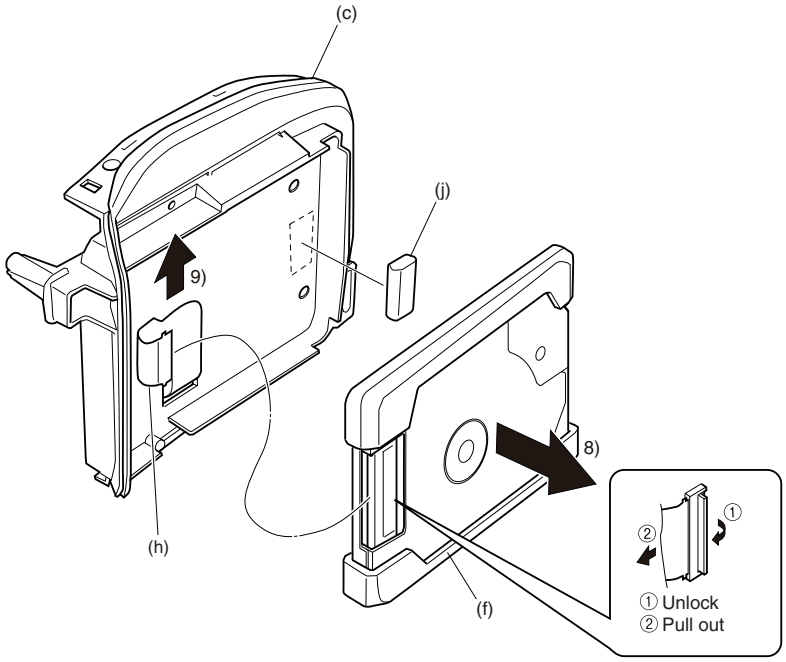


Fig. 5-3-14B

(15) HDD Unit [For DZ-BD7HA]

Note:

1) The HDD unit is a very delicate device, extremely susceptible to vibration or impact: Handle it with care, referring to "1-4 Cautions when Handling 1.8-inch HDD (Hard Disk Drive) for Camcorder".
2) Take care when handling a removed HDD in order to prevent personal data from leaking out. If the data on HDD is erased during the formatting function, it will be readable when special software is used. It is recommended to physically destroy the HDD when discarding it, to prevent data leaks.

1) Remove the top and bottom HDD cushions (a).

Procedure for reassembly/caution

1) Be sure to attach the cushions in the orientation shown in the figure. There is no specification for top and bottom cushions because they are the same.
2) When replacing the HDD unit, paste the ground sheet (c) to the specified position.
3) When attaching a new HDD unit, always initialize it.

Information:

With DZ-BD7HA, a HDD unit used (recorded) on another DZ-BD7HA can be re-used without any special operation/work.

(a) HDD unit
(b) HDD cushion
(c) Ground sheet

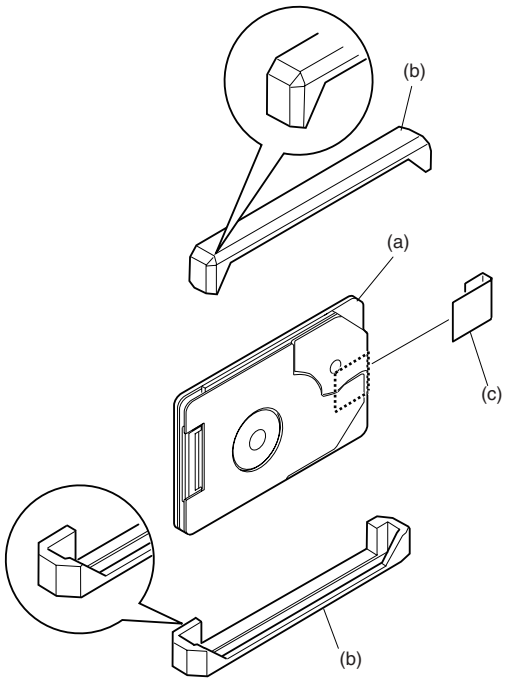


Fig. 5-3-15

(16) LCD Unit

1) Disconnect the flat cable from EXL circuit board (a).
2) Remove the two screws [E], taking care not to lose the LCD ground plate (b), which will be detached at this time.

Note:
Take great care when handling the LCD unit.
The LCD unit has an LCD panel that is a precision component: Subjecting it to any impact could result in a fault.

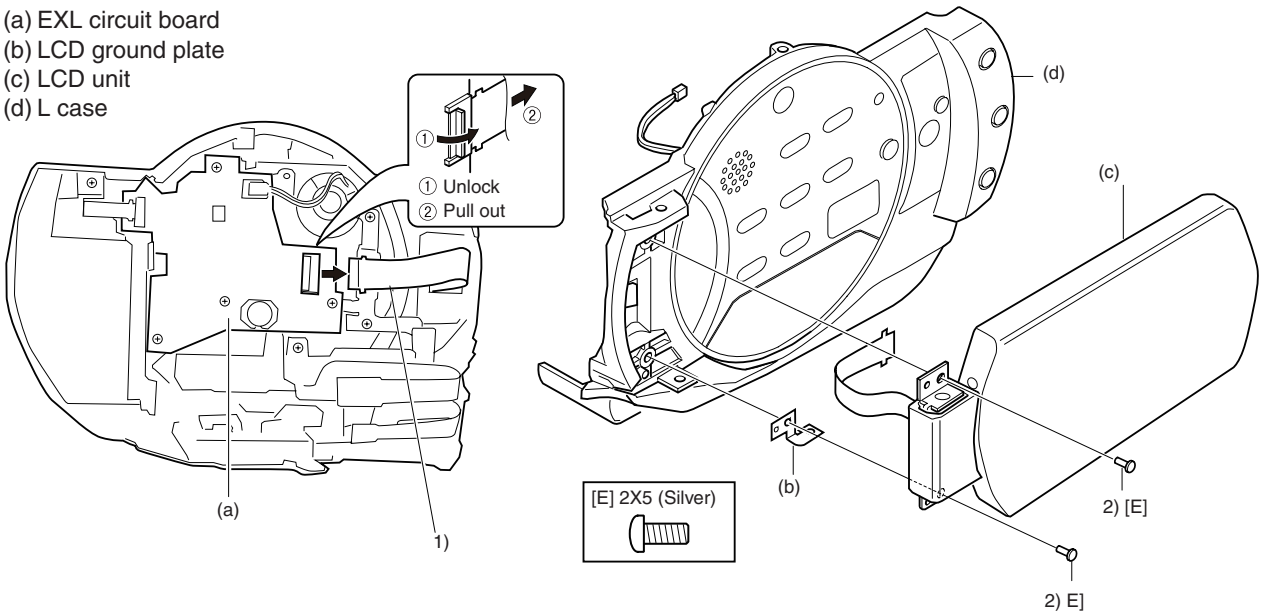
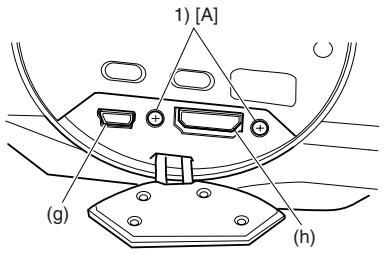


Fig. 5-3-16

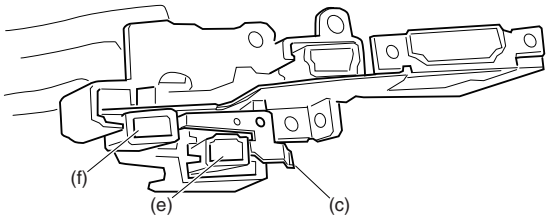
(17) AVS Circuit Board and USB Circuit Board

1) Remove the two screws [A].
2) Remove the three screws [B].
3) Remove the USB holder (a) from the L case (b) in the direction of the arrow.
   The ground sheet (c) will be detached at this time: Do not lose it.
4) Remove the screw [C].
5) Remove the USB frame (d) from USB holder in the direction of the arrow.
6) Remove the AVS circuit board (e) from USB holder in the direction of the arrow.
7) Remove the USB circuit board (f) from USB holder in the direction of the arrow.

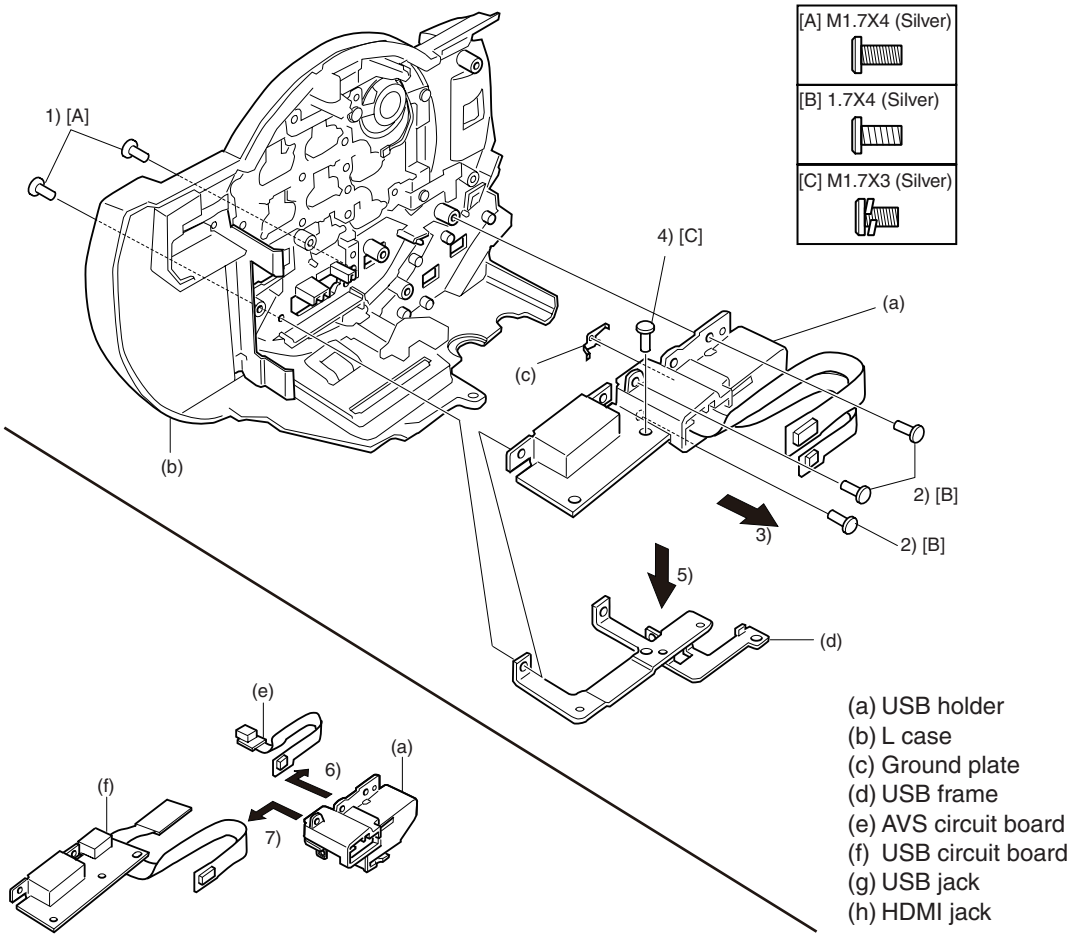
Caution during disassembly and reassembly:
When reassembling the USB holder, attach the ground plate to the specified position.



Detailed view of screw positions



Detailed view of ground plate position



(a) USB holder
(b) L case
(c) Ground plate
(d) USB frame
(e) AVS circuit board
(f) USB circuit board
(g) USB jack
(h) HDMI jack

Fig. 5-3-17

(18) GYRO Circuit Board, Lens Frame, Sensor Block, Lens Unit, Cushion and Crystal Filter

Information:
The sensor block comprises the 5MCMOS circuit board assembly on which the sensor is mounted.

1) Disconnect the flat cable.
2) Remove the screw [C].
3) Remove the GYRO circuit board (a) in the direction of the arrow.
4) Remove the graphite sheet [A] (b).
5) Remove the graphite sheet [B] (c).
6) Remove the two screws [B] and then remove the lens frame (d).
7) Remove the two screws [F] and then remove the ground sheet (e) and the Sensor block (f) from the lens unit (g).
8) Remove the cushion (h) and the crystal filter (i) from the lens unit.

Cautions during disassembly and reassembly:

1) The graphite sheets (A) and (B) cannot be reused: Purchase new ones for reassembly.
2) Be sure to paste the heat sink rubber to the specified position of lens unit: Forgetting to do so could cause a fault.
3) The crystal filter has an orientation specified: Take great care when attaching it.

Note:

1) The lens unit and crystal filter are precision components: Take great care when handling them. Adherence of any dust, foreign object, fingerprint, etc. to them, or any scratches or impact, could cause a fault.
2) Never use metal tweezers to handle the crystal filter: Doing so could damage it.

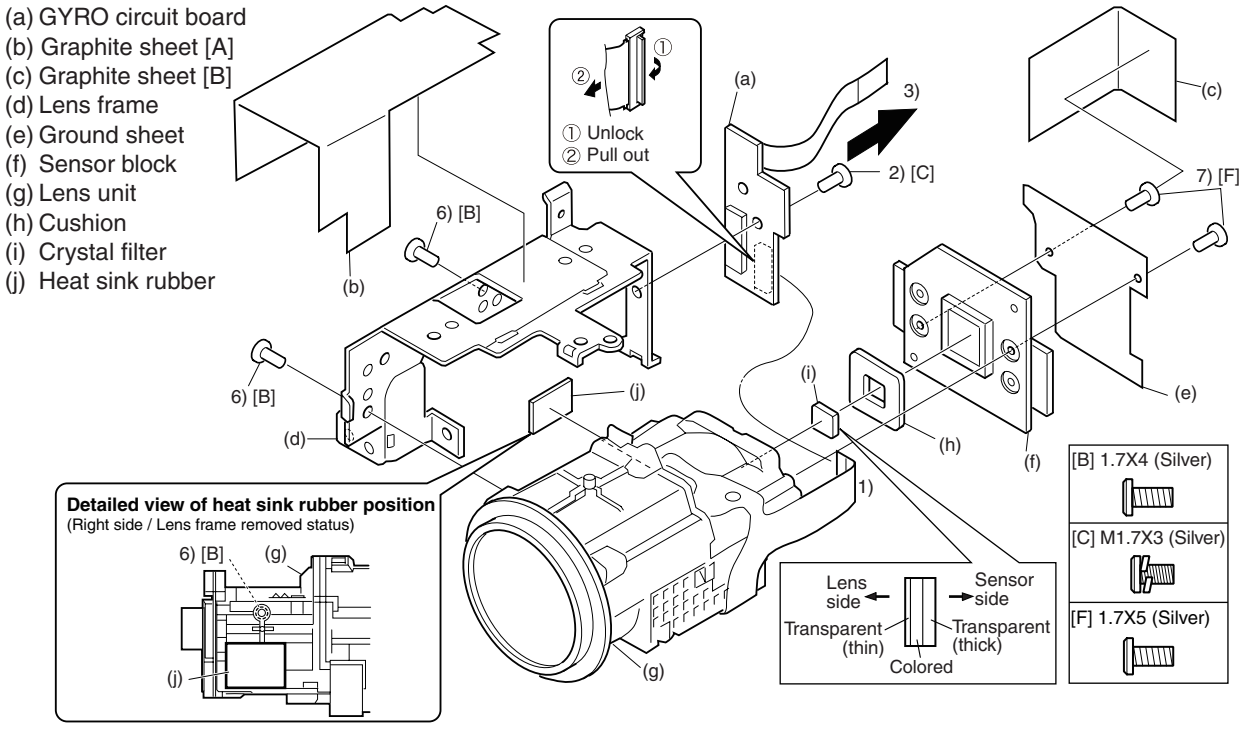


Fig. 5-3-18

6 Adjustment

6-1 Creating Reference Data

The reference data is necessary for adjustment: The adjustment software will not operate normally without it. Before adjustment, be sure to create the reference data, using the same model (with normal camera block) as the one to be adjusted.

The reference data is used to reduce the difference between environments of servicing site and factory (color temperature of light box, etc.). Using the reference data will increase adjustment accuracy.

6-1-1 Checking Reference Data

Before starting adjustment, check whether it will be necessary to create the reference data or not, referring to the flowchart below:

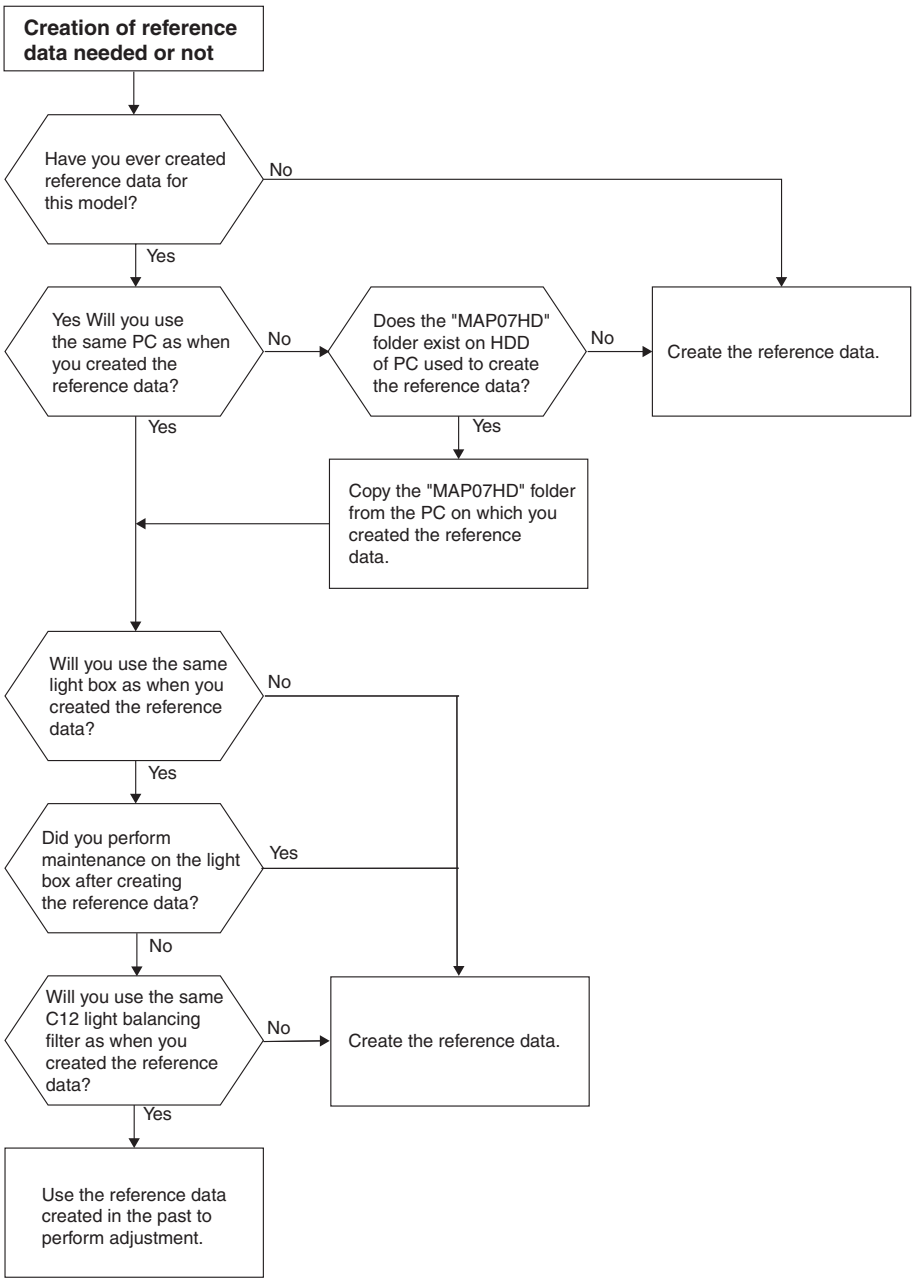

Creation of reference data needed or not
Have you ever created reference data for this model?
No
Yes
Yes Will you use the same PC as when you created the reference data?
No
Does the "MAP07HD" folder exist on HDD of PC used to create the reference data?
No
Create the reference data.
Yes
Yes
Copy the "MAP07HD" folder from the PC on which you created the reference data.
Will you use the same light box as when you created the reference data?
No
Yes
Did you perform maintenance on the light box after creating the reference data?
Yes
No
Will you use the same C12 light balancing filter as when you created the reference data?
No
Create the reference data.
Yes
Use the reference data created in the past to perform adjustment.

Fig. 6-1-1 Reference Data Check Flowchart

Information:

The reference data is usually created once for each model because it is recorded on hard disk drive (HDD) of PC with the adjustment software. However, creating reference data again is necessary in the following cases:

a) When performing adjustment using a light box that is different from that used when the reference data was created.
b) When performing maintenance of the light box used when creating the reference data (replacing fluorescent light, etc.).
c) When performing adjustment using a C12 light balancing filter that is different from that used when the reference data was created.
d) When deleting the folder containing the adjustment software from HDD.

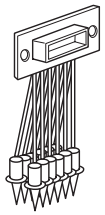
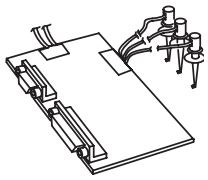
Restrictions:

If the same model with normal camera block as the one to be adjusted is not available, the reference data can be created by the following procedure. However, reference data created this way has been prepared at the factory, assuming the environment of service workplace, and may not be suitable for all service workplaces. Therefore, it is recommended that you create reference data using the same model with normal camera block as that to be adjusted.

1) Copy the adjustment software on HDD, referring to "6-1-6 Copying or Deleting Adjustment Software".
2) Start up Explorer and open the refdata folder in MAP07HD folder.
3) Refer to the following table to check the reference data file name of the model to be adjusted.
4) Copy the file with the same name as the reference data file name checked in step 3) in refdata folder to MAP07HD folder.

Model	Name of reference data file
DZ-BD7HA	W_BD7.dat
DZ-BD70A	

6-1-2 List of Jigs and Tools used when Creating Reference Data

<table>
<tr><td colspan="2">NEW
Adjustment Software
Note: Download from the Intranet.</td><td colspan="2">Halcyon connector
Parts No. TP14391
  </td></tr>
<tr><td colspan="4">Personal computer (PC)
Computer on which any of the following OS operates and which has a RS-232C terminal (*1)
OS: Windows 95/98/98 Second Edition/Me/2000 Professional/XP/NT4.0(*3)</td></tr>
<tr><td colspan="2">C12 light balancing filter
(Diameter: 46mm)
Parts No. 7099369
 </td><td colspan="2">DSP-R jig
Parts No. 7099448
  </td></tr>
<tr><td colspan="2">RS-232C cable (9-pin or 25-pin straight type)
[Generally available]
Check the number of pins of RS-232C terminals on PC and DSP-R jig and the shapes (male/female) before purchasing.</td><td>AV output cable
[Accessory: Parts No. EW12525]</td><td>DZ-ACS3
AC adapter/charger
[Accessory](*2)</td></tr>
<tr><td>Power cable for AC adapter/charger
[Accessory](*2)</td><td>DC power cord
[Accessory: Parts No. EV11011]</td><td colspan="2"></td></tr>
</table>

*1: The adjustment software used on camcorder is exclusively for Windows 95/98/98 Second Edition/ Me/2000 Professional/XP/NT4.0: The program cannot be run on MS-DOS.

*2: The part numbers of AC adapter/charger and power cable are different depending on the destination: Refer to the “Replacement Parts List” for the part numbers.

*3: Windows 2000 Professional/XP are the only OS that operate the additional corrective software for black spot noise.

6-1-3 Power Supply and Materials for Creating Reference Data

1) Camcorder (for creating reference data) that is the same model as the one to be adjusted and whose camera block is operating normally.

> Note:
> It is recommended that you use a brand-new unit of the same model when creating the reference data. If such a unit is not available, use the same model of the camcorder that is received from customer for repairing fault in BD drive that is other than in the camera block, and one where there is no problem in recording of camera image and the zoom is operating normally.

2) 3100 K light box (maintenance is necessary)
3) Color monitor (color TV with AV input jacks)
4) DC power supply for DSP-R jig (5 V/1 A)

6-1-4 Connections when Creating Reference Data

Connect the camcorder, jigs and test equipment as shown in Fig. 6-1-2.

> **Caution**
> It is very dangerous to perform any work with the camcorder disassembled, since the camcorder has a laser-emitting block: Do not remove any parts other than the adjustment cover.

(1) Setting of light box

1) Use a light box whose color temperature is controlled with no flickering: Using an inappropriate light box will interference with work.

(2) Setting and disassembly of Camcorder

1) Open the LCD monitor and insert a fine-tipped flat-bladed screwdriver into the groove in adjustment cover, and remove the cover from L case in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver.
2) Set the light box 30-50 cm away from camcorder, and eliminate any effects from surrounding light, except where such designation is given.
3) Use a small tripod to fix the camcorder, making certain it does not move during creation of reference data.
4) Set the lens surface of camcorder in parallel with the surface of light box as far as possible, and adjust the focus.

Note:
Always connect the Halcyon connector before connecting the DC power cord to the camcorder: Connecting the Halcyon connector after powering the camcorder could cause a fault.

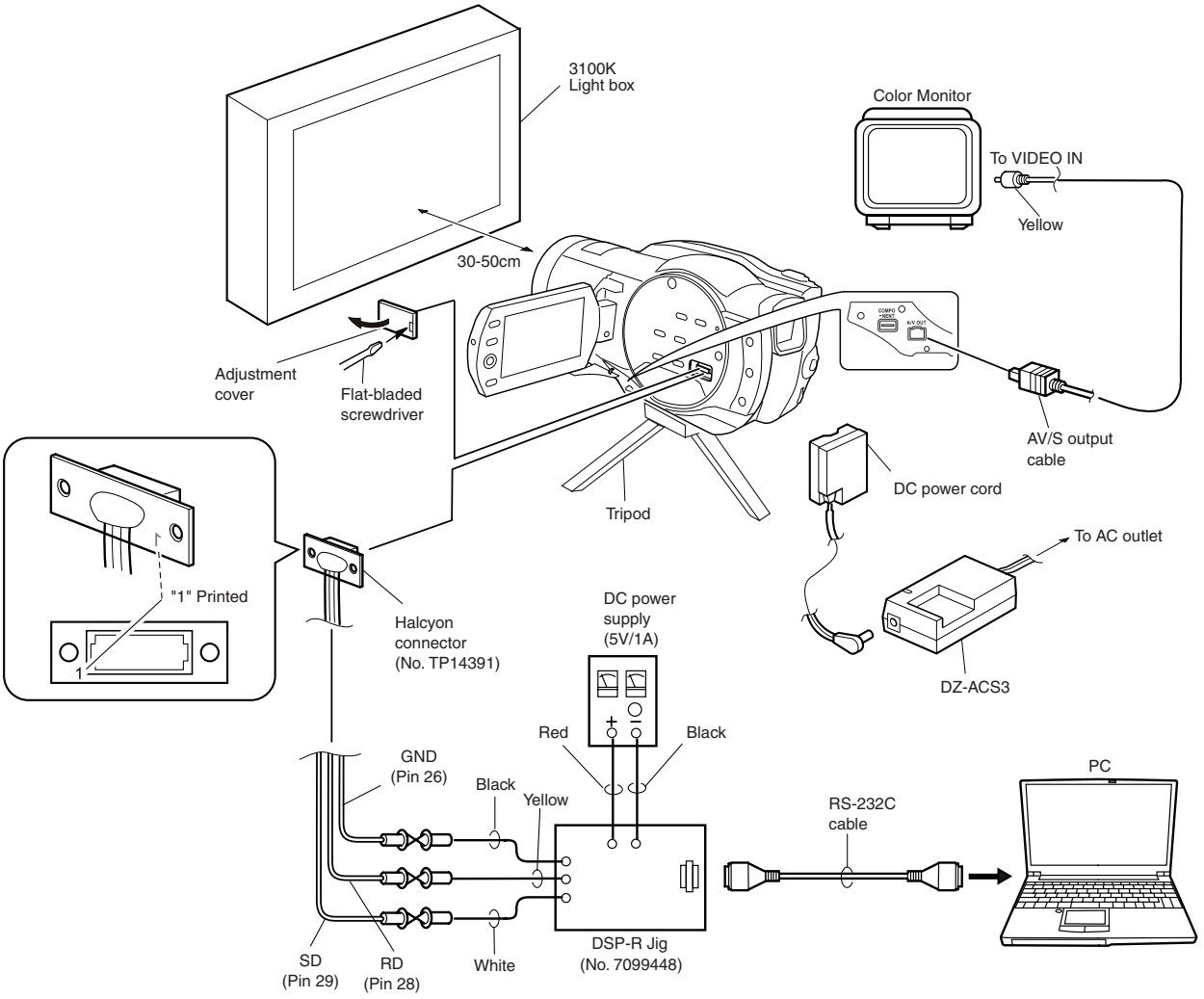


Fig. 6-1-2 Connections when Creating Reference Data

6-1-5 Settings when Creating Reference Data

When the connections for creating reference data are complete, set the camcorder and test equipment as follows:

1) Make sure that no BD/DVD or card is inserted: Neither is necessary when creating reference data.
2) Turn the Movie/Stills switch to “Movie”.
3) Set the power switch to “ON” after selecting “HDD” for DZ-BD7HA. Perform the following operations while watching the LCD monitor.
4) Press the MENU button to display the camera function setup screen.
5) Operate the joystick (⏮ / ⏭ / ◀◀ / ▶▶) to select “Initial Setup” and push the joystick straight down.
6) Operate the joystick to select “Reset” and push the joystick straight down to display the Setting Reset confirmation screen.
7) Operate the joystick to select “Yes” and push the joystick straight down to reset.
8) After resetting, operate the joystick in the above-mentioned manner to turn “OFF” the default demo mode. If it is not turned “OFF,” faults may occur during operation.
9) Press the MENU button to restore normal display.

Information:

The following table shows the menu status after the above settings:

The settings for Date Setup is not shown in the table below, since they do not have any meaning when creating reference data.

Furthermore, items concerning displays that appear only when BD/DVD is attached or when Stills is selected are omitted.

Item	Setting
Camera Functions Setup	
Program AE	Auto
White Balance.	Auto
EIS	On
Digital Zoom	40×
MIC Filter	Off
Auxiliary Line	Off
Recording Functions Setup	
HD Video Mode	HX
LCD/EVF Setup	
LCD Brightness	
EVF Brightness	
Color Level	
EVF Display	Auto

Item	Setting
Initial Setup	
Beep	On
Power Save	Off
Record LED	On
Language	English
Demo Mode	Off

6-1-6 Copying or Deleting Adjustment Software

Information:
The software for creating reference data is included in the adjustment software.

(1) Copy

1) Start the PC.
2) Start Explorer and create a new folder in HDD of PC. The name "MAP07HD" is recommended for the folder: If a folder with the same name exists, give the folder a similar name that is easily understandable.

Note:
1) Camcorder adjustment software that is capable of recording HD images and camcorder adjustment software that is only capable of recording HD images must be managed in different folders. Managing them in the same folder may cause problems during operation.
2) Be sure to manage the adjustment software for Windows and MS-DOS in different folders: Managing them in the same folder will interfere with adjustment.

3) Decompress the downloaded adjustment software. The adjustment software is usually compressed in the LZH or ZIP format.
4) Copy all folders and files created after decompression to the MAP07HD folder.

(2) Deleting

If it is necessary to delete the adjustment software from hard disk drive (HDD) of PC, delete the MAP07HD folder that was created during storage.

6-1-7 Starting and Terminating Reference Data Creation Software

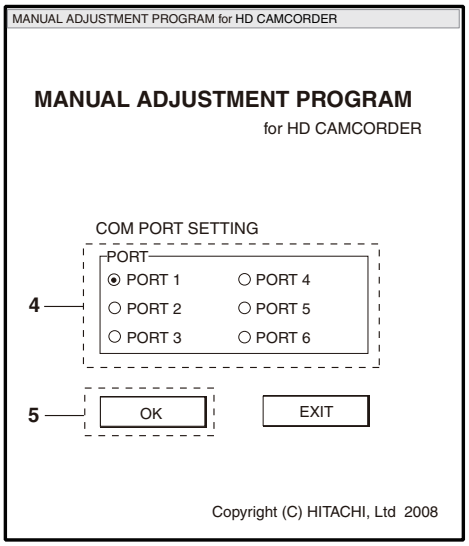
When connecting upon creating reference data, make sure that the power switch of the camcorder is "ON" (and that DZ-BD7HA is set to HDD mode) and that power is being supplied to the DSP-R jig. The reference data creation software will not start unless the connections for creating reference data are correct, and the camcorder or DSP-R jig is powered.
The reference data creation software will not start unless the connections for creating reference data are correct and the camcorder or DSP-R jig is powered. For subsequent operation, operate the PC mouse while watching the PC monitor screen.

Information:
1) Display ×××× on subsequent PC screen shows the model name.
2) The numbers on PC screens show the operational procedure.

(1) Start

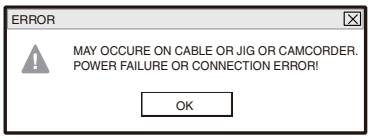
1) Start the PC. If the PC has already started, terminate all other applications.
2) Start Explorer, and double-click the "SETUPforMAP2007HD.EXE" file in MAP07HD folder to start the software.
3) Once the software has started, the COMMUNICATION PORT SETTING screen will appear.
4) Choose the communication port to which the RS-232C cable is connected, and then choose the radio button of corresponding port on COMMUNICATION PORT SETTING screen.
5) Click the OK button on the COMMUNICATION PORT SETTING screen, and then proceed with the MODEL SELECT screen.

COMMUNICATION PORT SETTING screen



Note:
If the following dialogs appear, perform the troubleshooting below:

POWER OR CONNECTION ERROR dialog



COM PORT ERROR dialog

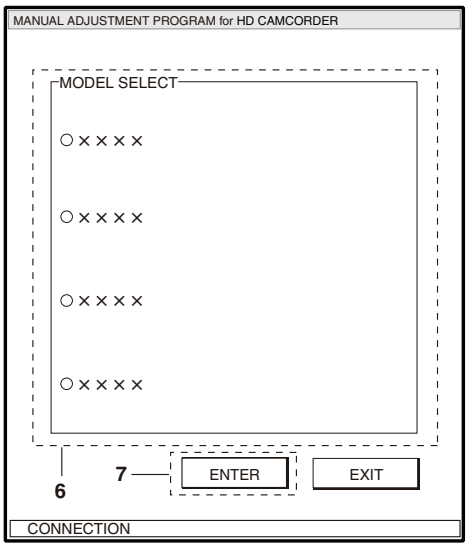
When the power or connection error dialog appears:
A connection is incorrect or power is not turned on.
Make sure that all connections are correct and that power is supplied to the reference data creating device or DSP-R interface jig.
Clicking the OK button will finish the software:
After solving the problem, restart the software.

When the communication port error dialog appears:
There was a mistake in selecting communication port.
Check the communication port.
Clicking the OK button will finish the software:
Select the communication port again after restart.

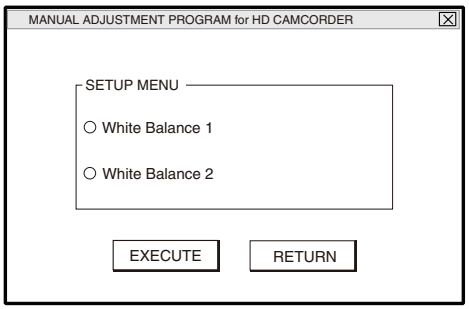
6) Choose the radio button of corresponding model name in MODEL SELECT screen.
7) Click the ENTER button in MODEL SELECT screen, and then proceed with the SETUP MENU screen.
Refer to next item for subsequent operations.
If there is an error in model selection, the FILE HANDLE ERROR dialog will appear. Click the OK button, and then choose the correct model.

Note:
If the FILE HANDLE ERROR dialog appears when the correct model has been chosen, obtain (download) the newest adjustment software, and then start over again. If the FILE HANDLE ERROR dialog still appears with the newest adjustment software, check with the factory.

MODEL SELECT screen.



SETUP MENU screen.



FILE HANDLE ERROR dialog

(2) Termination

1) Click the RETURN button on MENU screen of software to return to the MODEL SELECT screen.
2) Click the EXIT button on the MODEL SELECT screen.

Information:
If the PC does not accept any operation during work, or the reference data creating software does not work, perform the following procedure:
1) Set the power switch of reference data creating device to “OFF”.
2) Turn off the DC power supply of DSP-R jig.
3) Simultaneously press the Ctrl, Alt and Delete keys on PC keyboard to restart the PC.
4) Upon restarting the computer, set the power switch of the reference data creation software to “ON”. When the reference data creation software is set on DZ-BD7HA, after selecting “HDD”, turn the power supply to “ON”.
5) Switch the DC power supply for the DSP-R jig on again.
6) Restart the reference data creating software.

6-1-8 Creating Reference Data

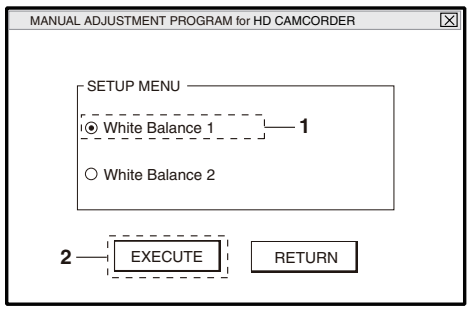
Start the setup software.
For subsequent operation, operate the PC mouse while watching the PC monitor screen.

Information:
It takes approx. 10 minutes to create reference data.
The following shows the times required for each item:
White Balance 1: Approx. 10 minutes
White Balance 2: Approx. 30 seconds

Preparation:
1) Point at light box without chart, filling the screen.
2) Prepare the C12 light balancing filter: Attach it during setup.

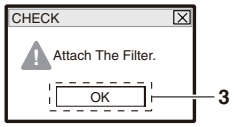
Procedure:

SETUP MENU screen.



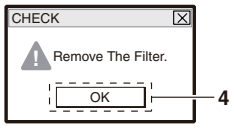
1) Choose WHITE BALANCE 1.
2) Click the EXECUTE button.

ATTACH THE FILTER dialog



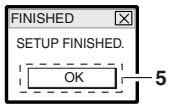
3) The ATTACH THE FILTER dialog will appear during setup. Attach the C12 light balancing filter over the lens of camcorder, and then click the OK button.

REMOVE THE FILTER dialog



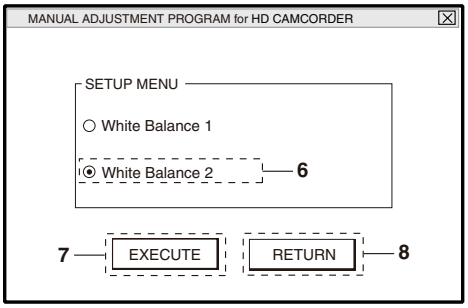
4) The REMOVE THE FILTER dialog will appear during setup.
Remove the C12 light balancing filter from the lens of camcorder, and then click the OK button.
After that, the ATTACH THE FILTER dialog and REMOVE THE FILTER dialog may occasionally appear: Reattach the C12 light balancing filter and remove it each time.

SETUP FINISHED dialog



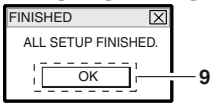
5) When setup is complete, the SETUP FINISHED dialog will appear: Click the OK button to restore the SETUP MENU screen. When setup is complete with the C12 light balancing filter attached, remove the C12 light balancing filter.

SETUP MENU screen.



6) Choose WHITE BALANCE 2 on the SETUP MENU screen.
7) Repeat steps 2)-5).
8) Click the RETURN button.

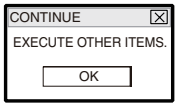
ALL SETUP FINISH dialog



9) Click the OK button to complete the creation of reference data.

Note:
Neither White Balance 1 nor White Balance 2 in SETUP MENU can be executed independently. Be sure to execute all items at the same time.
If you click the RETURN button on the SETUP MENU screen with an unfinished item, the EXECUTE OTHER ITEMS dialog will appear. Click the OK button in EXECUTE OTHER ITEMS dialog, and then execute the unfinished items.

EXECUTE OTHER ITEMS dialog



6-2 Setups for Adjustment

Restrictions:
Be sure to perform "6-1-1 Checking Reference Data" in advance.
No adjustment can be done without reference data.

6-2-1 List of Jigs and Tools for Adjustment

Jigs and tools used for adjustment are the same as those used for creating reference data, with the exception of the HDMI cable. For details, refer to ”6-1-2 List of jigs and tools used when creating reference data”

1) Personal computer
2) Adjustment software
3) Halcyon connector
4) C12 light balance filter
5) DSP-R Jig
6) RS-232C cable
7) AV/S output cable
8) DZ-ACS3
9) Power cable
10) DC power cord
11) HDMI cable (Generally available)(*1)

6-2-2 Test Equipment, Power Supply and Charts for Adjustment

1) Color bar chart
2) 3100 K light box (maintenance is necessary)
3) Backfocus chart
4) Color monitor (color TV with AV input jacks)
5) HDTV(*1)
6) Oscilloscope
7) Vectorscope(*2)
8) Frequency counter
9) DC power supply for DSP-R jig (5 V/1 A)

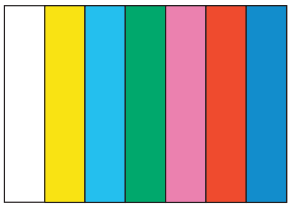


Fig. 6-2-1 Color Bar Chart

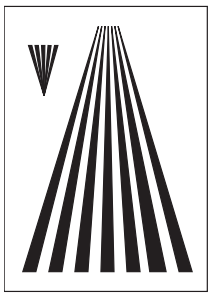


Fig. 6-2-2 Backfocus Chart

*1: HDTV and HDMI cables are used to confirm whether or not there are any spot noises in ”6-4-9 Spot Noise 1” and ”6-4-10 Spot Noise 2”. For more details regarding connections, refer to ”6-4-9 Spot Noise 1” and ”6-4-10 Spot Noise 2.”

*2: It is recommended that you use a vectorscope when performing the chroma gain adjustment.
You can use an oscilloscope instead: Note, however, that the adjustment accuracy will be lower.

6-2-3 Connections for Adjustment

Connect the camcorder, jigs and test equipment as shown in the Fig. 6-2-3.

Caution

It is very dangerous to perform any work with the camcorder disassembled, since the camcorder has a laser-emitting block: Do not remove any parts other than the adjustment cover.

(1) Setting of light box

1) Use the same light box as when the reference data was created: Its color temperature and illuminance are strictly controlled and free from flickering. If the setting of color box is not appropriate, the adjustment software may not operate normally.

(2) Setting and disassembly of Camcorder

1) Open the LCD monitor and insert a fine-tipped flat-bladed screwdriver into the groove in adjustment cover, and remove the cover from L case in the direction of the arrow: Be very careful not to scratch the cover or L case with screwdriver.
2) Set the light box 30-50 cm away from camcorder, and eliminate any effects from surrounding light, except where such designation is given.
3) Set the lens surface of camcorder in parallel with the surface of light box as far as possible, and adjust the focus.
4) Use a small tripod to fix the camcorder, making certain it does not move during adjustment.
5) Be sure to connect the video output of camcorder to the video input jack of color monitor, which is usually terminated by 75 ohm: If the video output is not terminated by 75 ohm, the video output value cannot be measured correctly.

Note:
Always connect the Halcyon connector before connecting the DC power cord to the camcorder: Connecting the Halcyon connector after powering the camcorder could cause a fault.

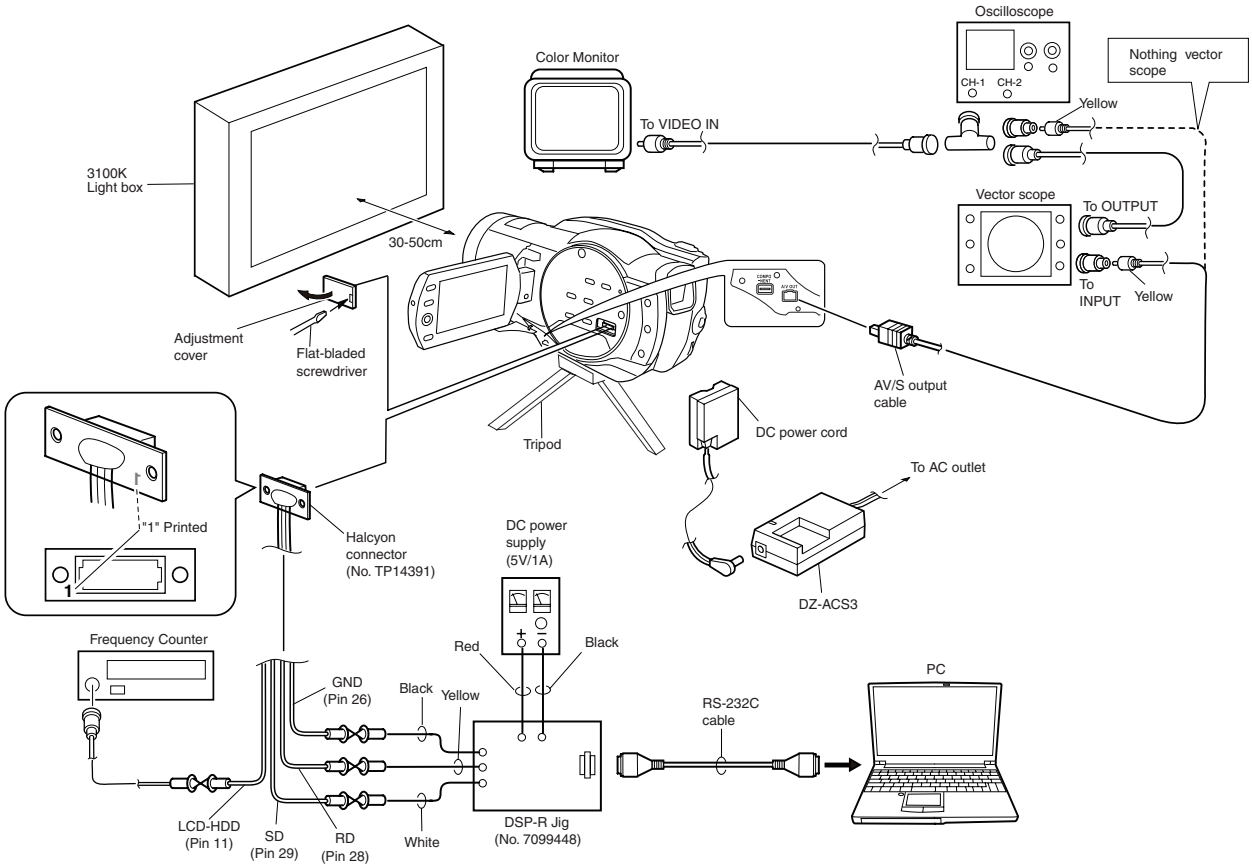


Fig. 6-2-3 Connections for Adjustment

6-2-4 Settings for Adjustment

When the connections for adjustment are complete, set the camcorder and test equipment as follows:

(1) Setting the Camcorder

Information:
This item is the same as when creating reference data.

1) Make sure that no DVD or card is inserted: Neither is necessary when adjustment.
2) Turn the Movie/Stills switch to "Movie".
3) Set the power switch to "ON" after selecting "HDD" for DZ-BD7HA. Perform the following operations while watching the LCD monitor.
4) Press the MENU button to display the camera function setup screen.
5) Operate the joystick (⏮ / ⏭ / ◀◀ / ▶▶) to select "Initial Setup" and push the joystick straight down.
6) Operate the joystick to select "Reset" and push the joystick straight down to display the Setting Reset confirmation screen.
7) Operate the joystick to select "Yes" and push the joystick straight down to reset.
8) After resetting, operate the joystick in the above-mentioned manner to turn "OFF" the default demo mode. If it is not turned "OFF," faults may occur during operation.
9) Press the MENU button to restore normal display.

Information:
The following table shows the menu status after the above settings:
The settings for Date Setup is not shown in the table below, since they do not have any meaning when adjusting.
Furthermore, items concerning displays that appear only when BD/DVD is attached or when Stills is selected are omitted.

Item	Setting
Camera Functions Setup	
Program AE	Auto
White Balance	Auto
EIS	On
Digital Zoom	40×
MIC Filter	Off
Recording Functions Setup	
HD Video Mode	HX
LCD/EVF Setup	
LCD Brightness	
EVF Brightness	
Color Level	
EVF Display	Auto

Item	Setting
Initial Setup	
Beep	On
Power Save	Off
Record LED	On
Language	English
Demo Mode	Off

(2) Setting test equipment

The names of switches, etc. of test equipment may vary depending on the manufacturer and model. Some switches in addition to those shown below may have to be set: See the instruction manual of test equipment for details.

1) Oscilloscope

a) Probe: 10:1

b) TIME/DIV: 10 or 20 μs (except where some other designation is given)

c) VOLTS/DIV: Change depending on the measurement object

d) TRIGGER SOURCE: CH1 (except where some other designation is given)

e) AC/DC/GND: AC

2) Vectorscope

a) SATURATION: 75%

6-2-5 Starting and Terminating Adjustment Software

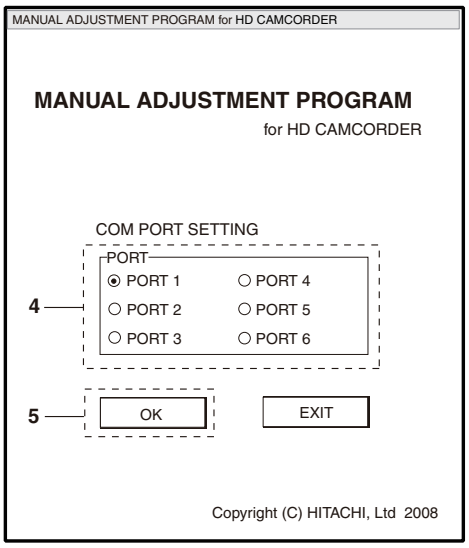
When connecting during adjustment make sure that the power switch of the camcorder is "ON" (and that DZ-BD7HA is set to HDD mode) and that power is being supplied to the DSP-R jig.
The adjustment software will not start unless the connections for adjustment are correct, and the camcorder or DSP-R jig is powered.
For subsequent operations, operate the PC mouse while watching the PC monitor screen.

Information:
1) Display ×××× on subsequent PC screen shows the model name.
2) The numbers on PC screens show the operational procedure.

(1) Start

1) Start the PC. If the PC has already started, terminate all other applications.
2) Start Explorer, and double-click the "MAP2007HD.EXE" file in MAP07HD folder to start the adjustment software.
3) Once the adjustment software has started, the COMMUNICATION PORT SETTING screen will appear.
4) Check the communication port to which the RS-232C cable is connected, and then choose the radio button of corresponding port on COMMUNICATION PORT SETTING screen.
5) Click the OK button on the COMMUNICATION PORT SETTING screen, and then proceed with the MODEL SELECT screen.

COMMUNICATION PORT SETTING screen

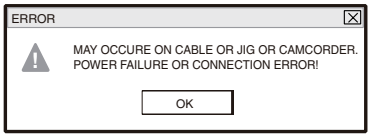


Note:
If the dialogs on right appear, perform the following troubleshooting:

When the power or connection error dialog appears:
A connection is incorrect or power is not turned on.
Make sure that all connections are correct and that power is supplied to the camcorder or DSP-R interface jig.
Clicking the OK button will finish the software:
After solving the problem, restart the software.

When the communication port error dialog appears:
There was a mistake in selecting communication port.
Check the communication port.
Clicking the OK button will finish the software:
Select the communication port again after restart.

POWER OR CONNECTION ERROR dialog



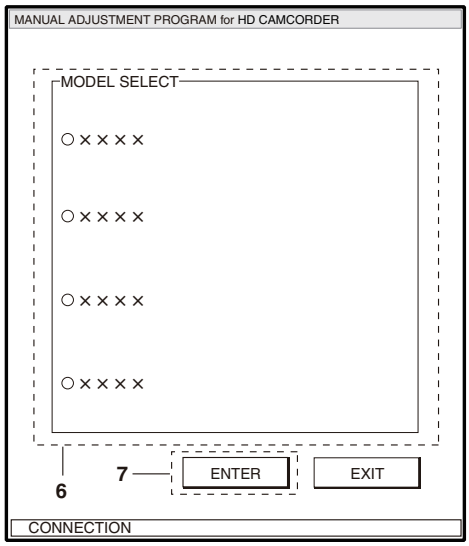
COM PORT ERROR dialog

Information:
When communications between the PC and camcorder are normal during adjustment, the word “CONNECTION” in status bar (bottom left) of each screen will flash.

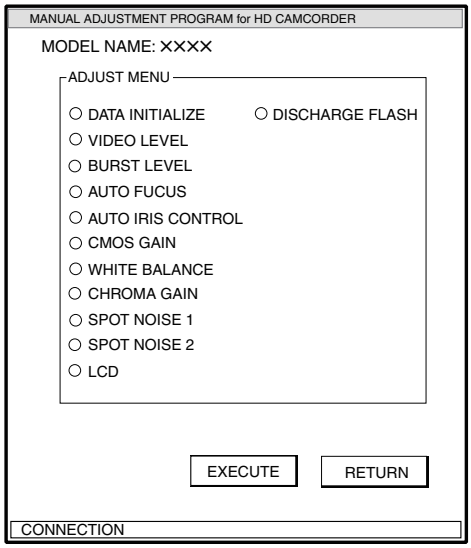
6) Choose the radio button of corresponding model name in MODEL SELECT screen.
7) Click the ENTER button in MODEL SELECT screen, and then proceed with the ADJUST MENU screen.
Start of the adjustment program is now complete. Refer to “6-4 Adjustment Procedure” for subsequent operations.
If there is an error in model selection, the FILE HANDLE ERROR dialog will appear. Click the OK button, and then choose the correct model.

Note:
If the FILE HANDLE ERROR dialog appears when the correct model has been chosen, obtain (download) the newest adjustment software, and then start over again.
If the FILE HANDLE ERROR dialog still appears with the newest adjustment software, check with the factory.

MODEL SELECT screen.



ADJUST MENU screen.



FILE HANDLE ERROR dialog

(2) Termination

1) Click the RETURN button on MENU screen of adjustment software to return to the MODEL SELECT screen.
2) Click the EXIT button on the MODEL SELECT screen.

Information:

If the PC does not accept any operation during work, or the adjustment software does not work, perform the following procedure:

1) Set the power switch of camcorder to “OFF”.
2) Turn off the DC power supply of DSP-R jig.
3) Simultaneously press the Ctrl, Alt and Delete keys on PC keyboard to restart the PC.
4) Upon restarting the computer, set the power switch of the camcorder to “ON”. When the camcorder is set on DZ-BD7HA, after selecting “HDD”, turn the power supply to “ON”.
5) Switch the DC power supply for the DSP-R jig on again.
6) Restart the adjustment software.

6-3 List of Adjustment Items

6-3-1 Adjustment Software Hierarchy Diagram

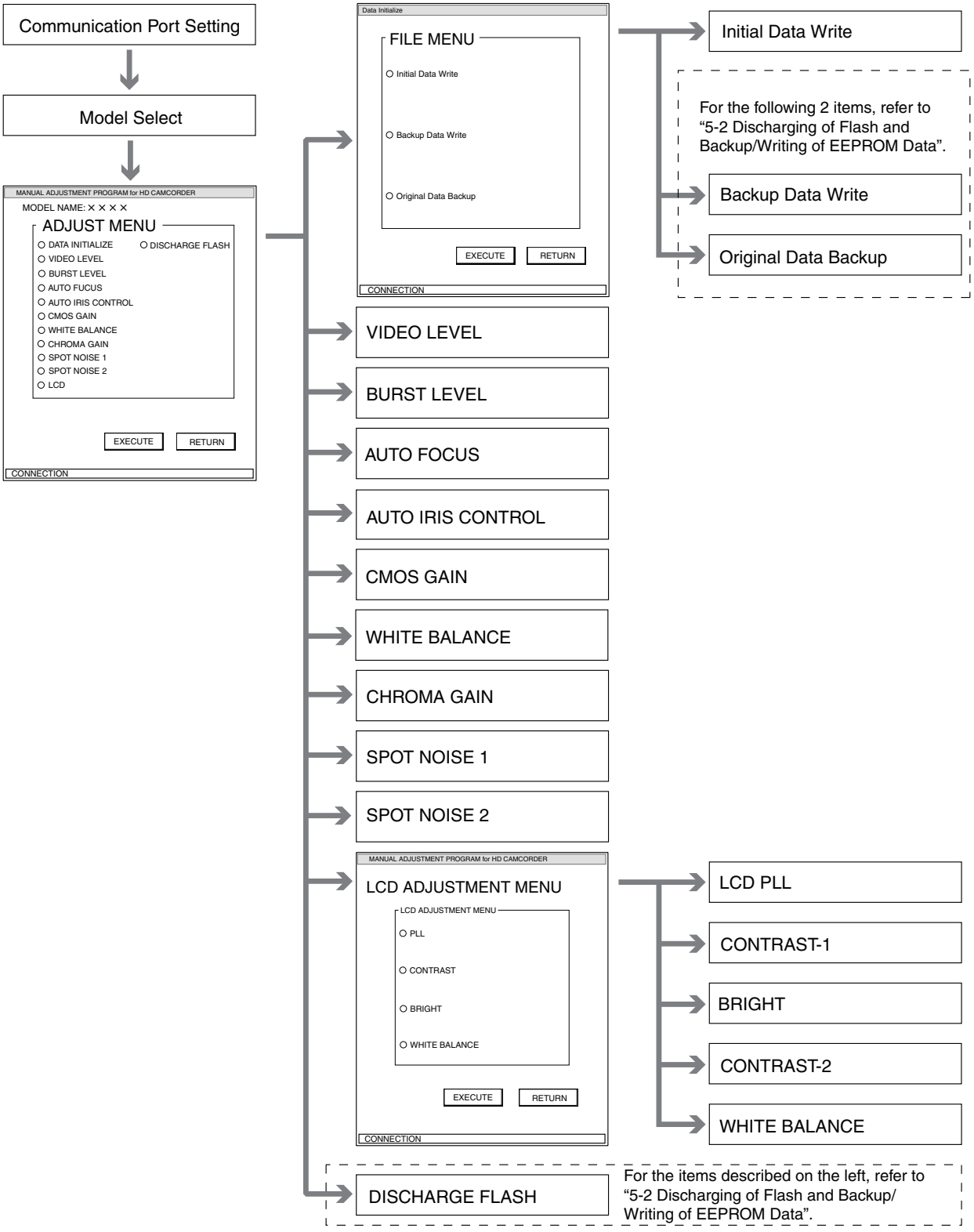


Fig. 6-3-1

6-3-2 List of Adjustments Needed After Replacing Major Components

Item	Major Components		
	MAN circuit board or I2303(*1) (EEPROM backup data already written)	MAN circuit board or I2303(*1) (EEPROM data backup disabled)(*2)	LCD unit
Initial Data Write		●	
Video Level		●	
Burst Level		●	
Autofocus		●	
Auto Iris Control		●	
CMOS Gain		●	
White Balance		●	
Chroma Gain		●	
Spot Noise 1		●	
Spot Noise 2		●	
LCD PLL	●	●	●
LCD Contrast-1(*3)	●	●	●
LCD Bright(*3)	●	●	●
LCD Contrast-2(*3)	●	●	●
LCD White Balance	●	●	●

*1: When replacing the MAN circuit board or EEPROM, perform “Backup/Writing of EEPROM Data” in advance while referring to “5-2 Discharging of Flash and Backup/Writing of EEPROM Data”.

*2: “EEPROM data backup disabled” refers to when the backup of EEPROM data from the MAN circuit board to be replaced could not be properly executed due to some fault, such as the camcorder not being turned on, etc.

*3: The following three items cannot be performed singly. Be sure to perform these adjustments as a set with the three items, and in the order stated:
LCD contrast – 1
LCD bright
LCD contrast – 2

Item	Major Components			
	Lens Unit	Sensor Assembly	I4505	I4703
Initial Data Write				
Video Level				●
Burst Level				●
Autofocus	●		●	
Auto Iris Control	●		●	
CMOS Gain		●		
White Balance		●		
Chroma Gain		●		
Spot Noise 1		●		
Spot Noise 2		●		
LCD PLL				
LCD Contrast-1(*3)				
LCD Bright(*3)				
LCD Contrast-2(*3)				
LCD White Balance				

*3: The following three items cannot be performed singly. Be sure to perform these adjustments as a set with the three items, and in the order stated:
LCD contrast – 1
LCD bright
LCD contrast – 2

6-3-3 Purpose of Adjustments and Incompleted Phenomenon

Item	Purpose	Incompleted Phenomenon
Initial Data Write	To write initial data to EEPROM in which adjustment data has been stored	----------
Video Level	To set the video output level.	The picture becomes dark or whitish.
Burst Level	To set the burst level.	
Autofocus	To set out-of-focus correction level during zoom.	Focus is lost during zooming. It takes time until a subject is brought into focus, or correct focus is not obtained.
Auto Iris Control	To set iris control data.	The picture becomes too bright or dark.
CMOS Gain	Adjust the gain linearity of the CMOS (image sensor).	Linearity related to changes in brightness will be lost.
White Balance	To compensate for unevenness in the chroma signal and input auto white balance control data.	Color reproduction becomes defective.
Chroma Gain	To set color saturation for the reference color temperature.	Color of the picture is denser or lighter than that of the subject.
Spot Noise 1	To correct white spot noise.	Spot white noise occurs.
Spot Noise 2	To correct black spot noise.	Spot black noise occurs.
LCD PLL	To synchronize LCD image.	Synchronization of LCD image is distorted.
LCD Contrast-1	To set the bright level and contrast of the LCD monitor.	Color reproduction becomes defective of the LCD monitor.
LCD Bright		
LCD Contrast-2		
LCD White Balance		

Information:
The “DISCHARGE FLASH” displayed on the Adjustment Menu screen is a function that discharges a voltage of approximately 300 V down to approximately 100 V and is not an adjustment function. For details regarding its method of operation, refer to “5-2 Discharging of Flash and Backup/Writing of EEPROM Data”.

6-4 Adjustment Procedure

Start the adjustment software.

For the subsequent operation, operate the PC mouse while watching the PC monitor screen.

Information:

1) Display ×××× on subsequent PC screen shows the model name.

2) The numbers on PC screens show the operational procedure.

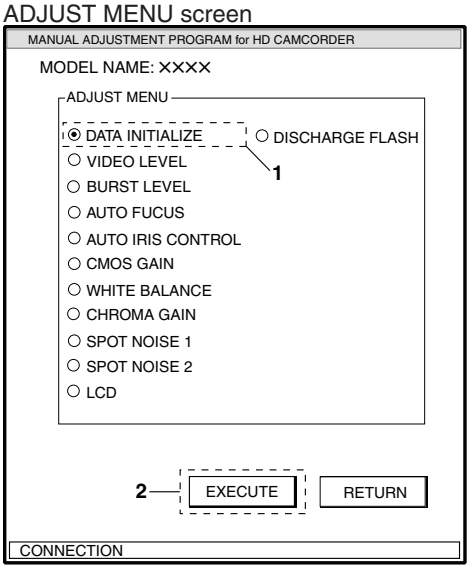
6-4-1 Initial Data Write

Note:

1) Write the initial data only after the MAN circuit board has been replaced when the backup of EEPROM data could not be performed using the MAN circuit board before replacement.
   Refer to "5-2 Discharging of Flash and Backup/Writing of EEPROM Data
2) Writing the initial data will initialize all the adjustment data in EEPROM. After writing, be sure to perform all the appropriate adjustments.

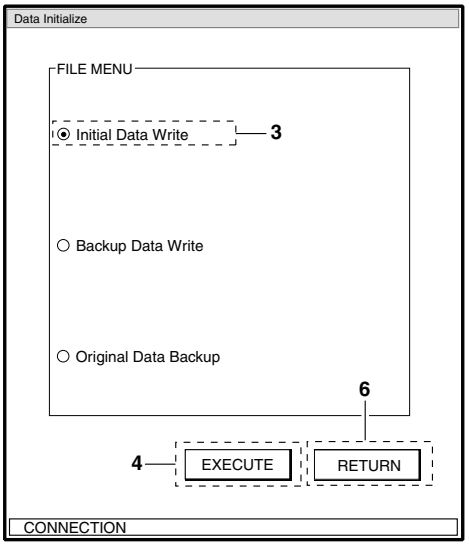
Procedure:

ADJUST MENU screen



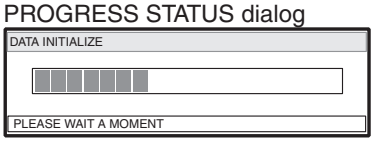
1) Choose DATA INITIALIZE.
2) Click the EXECUTE button.

DATA INITIALIZE MENU screen

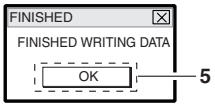


3) Choose Initial Data Write.
4) Click the EXECUTE button to start writing of initial data.
   The progress status can be confirmed using the PROGRESS STATUS dialog.

PROGRESS STATUS dialog



INITIALIZATION FINISHED dialog



5) Click the OK button to restore the DATA INITIALIZE MENU screen.
6) Click the RETURN button on DATA INITIALIZE MENU screen to restore the ADJUST MENU screen, and then be sure to perform all the adjustment items.

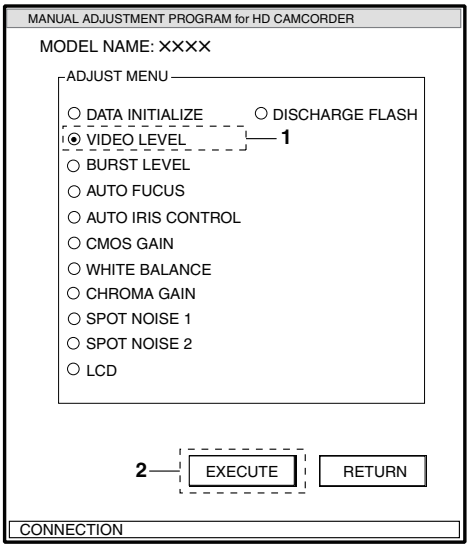
6-4-2 Video Level

Preparations:

1) Connect the oscilloscope CH1 to video out.
2) Switch the oscilloscope V-MODE to "CH1" and TRIGGER SOURCE to "CH1".

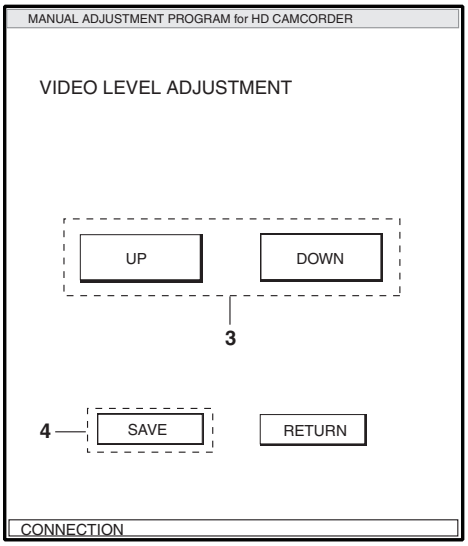
Procedure:

ADJUST MENU screen



1) Choose VIDEO LEVEL.
2) Click the EXECUTE button.
   During video level adjustment, the camcorder will automatically be switched to test mode and the video output will appear solid white.

VIDEO LEVEL ADJUSTMENT screen



3) Click the UP or DOWN button so that level of waveform is 1.0 ± 0.05 Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level of waveform.

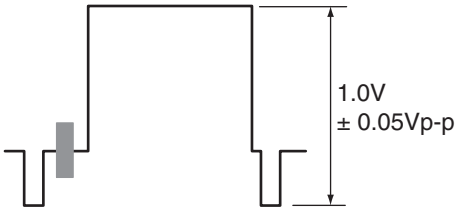
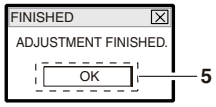


Fig. 6-4-1

4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the ADJUST MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the ADJUST MENU screen.

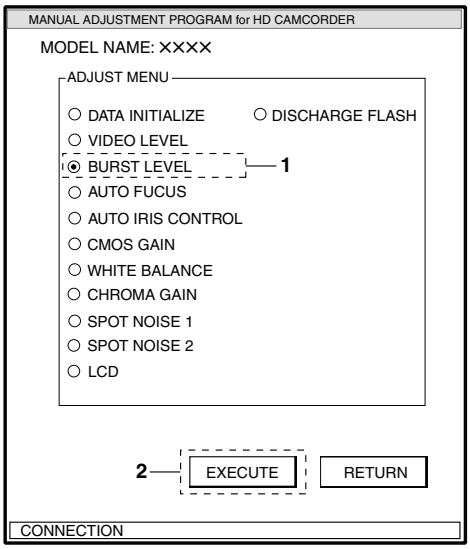
6-4-3 Burst Level

Preparations:

1) Connect the oscilloscope CH1 to video out.
2) Switch the oscilloscope V-MODE to "CH1" and TRIGGER SOURCE to "CH1".

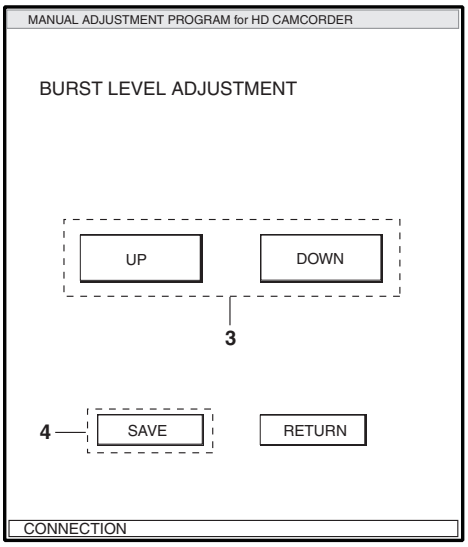
Procedure:

ADJUST MENU screen



1) Choose BURST LEVEL.
2) Click the EXECUTE button.
   During burst level adjustment, the camcorder will automatically be switched to test mode and the video output will appear solid white.

BURST LEVEL ADJUSTMENT screen



3) Click the UP or DOWN button so that burst level of the waveform is 286mV ± 15 mVp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in burst level.

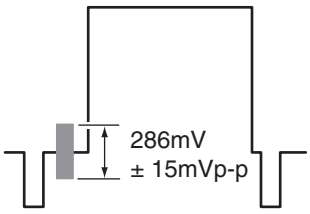
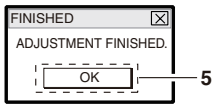


Fig. 6-4-2

4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the ADJUST MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the ADJUST MENU screen.

6-4-4 Autofocus

Preparations:

1) Use the backfocus chart vertically (portrait mode) as shown in Fig. 6-4-3.
2) Point at backfocus chart 1500mm ± 5 mm away from the lens surface: Measure the distance precisely.
3) Set the zoom to telephoto end, and make sure that the center of backfocus chart appears.
4) If an illuminometer is available and the brightness of illumination can be varied, set the illuminance of backfocus chart surface to 200-400 lx. This setting is not necessary if the brightness of illumination cannot be varied: Perform adjustment under indoor light that is as bright as possible.

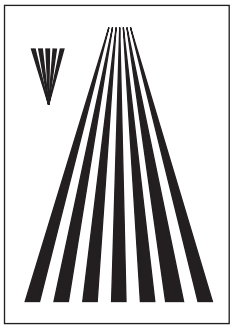
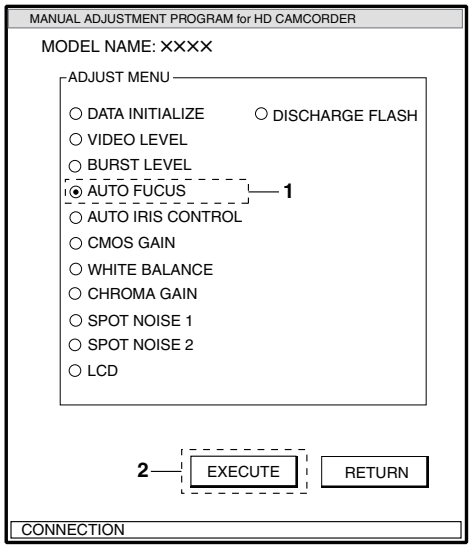


Fig. 6-4-3 Backfocus Chart

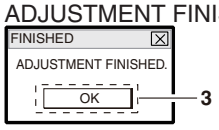
Procedure:

ADJUST MENU screen



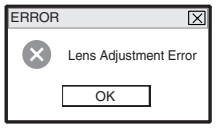
1) Choose AUTO FOCUS.
2) Click the EXECUTE button to start adjustment.

ADJUSTMENT FINISHED dialog



3) Click the OK button in dialog to restore the ADJUST MENU screen.

AF ADJUSTMENT ERROR dialog



If the AF ADJUSTMENT ERROR dialog appears, click the OK button in dialog, perform the following troubleshooting, and then execute readjustment:

a) Increase the illumination.
b) Set the distance between the backfocus chart and lens surface precisely to 1500mm ± 5 mm.

If the AF adjustment error dialog still appears even after troubleshooting, the connection of lens unit may be incorrect or the unit may be faulty.

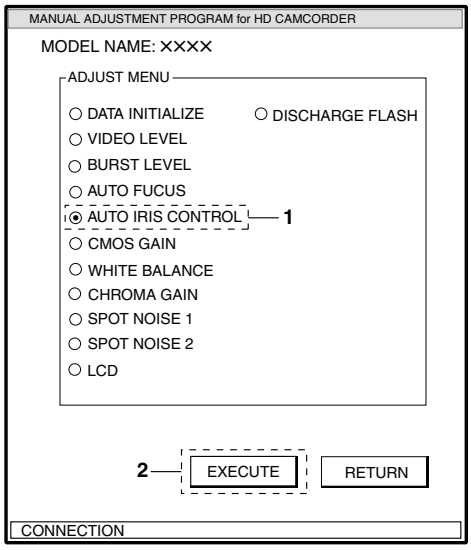
6-4-5 Auto Iris Control

Preparation:

Set zoom to wide-angle end, and point at light box without chart, filling the screen.

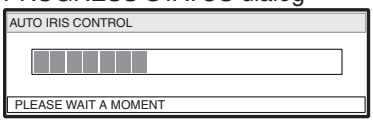
Procedure:

ADJUST MENU screen

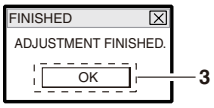


1) Choose AUTO IRIS CONTROL.
2) Click the EXECUTE button to start adjustment.
   The progress status can be confirmed using the PROGRESS STATUS dialog.

PROGRESS STATUS dialog

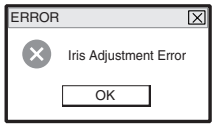


ADJUSTMENT FINISHED dialog



3) Click the OK button in dialog to restore the ADJUST MENU screen.

IRIS ADJUSTMENT ERROR dialog



If the IRIS ADJUSTMENT ERROR dialog appears, click the OK button in dialog, perform the appropriate corrective action, and then perform readjustment. If the IRIS ADJUSTMENT ERROR dialog still appears after the corrective action, the lens unit may be faulty:

a) Turn the light box off, and then make sure that no surrounding light reflects on glass surface of light box. If any surrounding light does reflect on it, perform adjustment in a place where no surrounding light will affect the adjustment.
b) Widen or shorten the distance between the light box and camcorder.

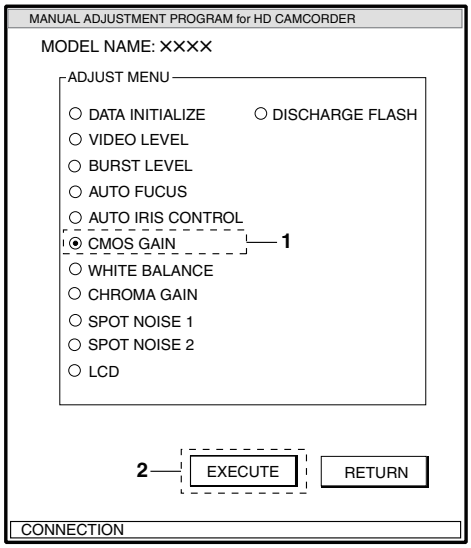
6-4-6 CMOS Gain

Preparation:

Set zoom to wide-angle end, and point at light box without chart, filling the screen.

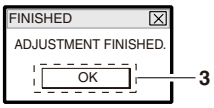
Procedure:

ADJUST MENU screen



1) Choose CMOS GAIN.
2) Click the EXECUTE button to start adjustment.

ADJUSTMENT FINISHED dialog



3) Click the OK button in dialog to restore the ADJUST MENU screen.

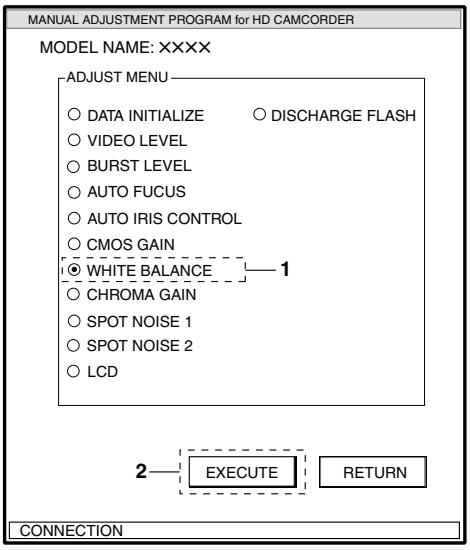
6-4-7 White Balance

Preparation:

1) Point at light box without chart, filling the screen.
2) Prepare the C12 light balancing filter: Attach it during adjustment.

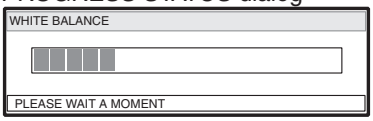
Procedure:

ADJUST MENU screen

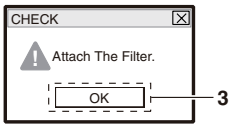


1) Choose WHITE BALANCE.
2) Click the EXECUTE button start adjustment.
   The progress status can be confirmed using the PROGRESS STATUS dialog.

PROGRESS STATUS dialog

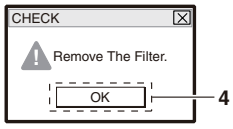


ATTACH THE FILTER dialog



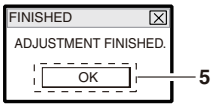
3) The ATTACH THE FILTER dialog will appear during setup.
   Attach the C12 light balancing filter over the lens of camcorder, and then click the OK button in ATTACH THE FILTER dialog.

REMOVE THE FILTER dialog



4) The REMOVE THE FILTER dialog will appear during setup.
   Remove the C12 light balancing filter from the lens of camcorder, and then click the OK button in REMOVE THE FILTER dialog.
   After that, the ATTACH THE FILTER dialog and REMOVE THE FILTER dialog may occasionally appear: Reattach the C12 light balancing filter and remove it each time.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the ADJUST MENU screen.

6-4-8 Chroma Gain

Preparation:

1) Set zoom to wide-angle end, and point at light box without chart, filling the screen.
2) Prepare the color bar chart: Use it during adjustment.

Procedure:

1) Press the MENU button on camcorder, and joystick (⏮ / ⏭ / ◀◀ / ▶▶) buttons to specify “White Balance.: Set” to display the white balance screen. (See Fig. 6-4-4)

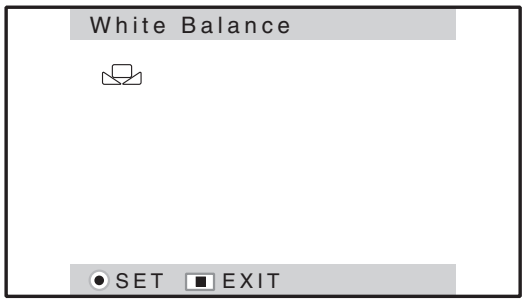


Fig. 6-4-4 White balance set screen

2) Press the joystick straight down. The “” mark on the white balance setting screen will blink. Hold down the joystick until the “” mark changes to a steady light.
3) Press the STOP/EXIT button on camcorder.
4) Insert the color bar chart into light box
5) Set the camcorder zoom to a wide angle by adjusting the distance between the camcorder and the color bar chart, and record the color bar chart as shown in Fig. 6-4-5.

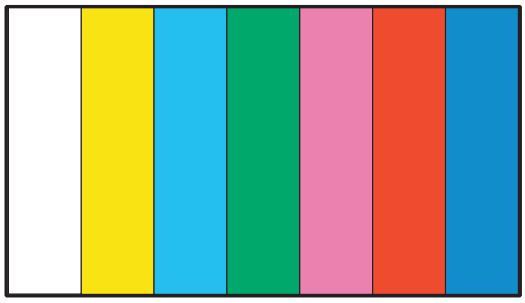
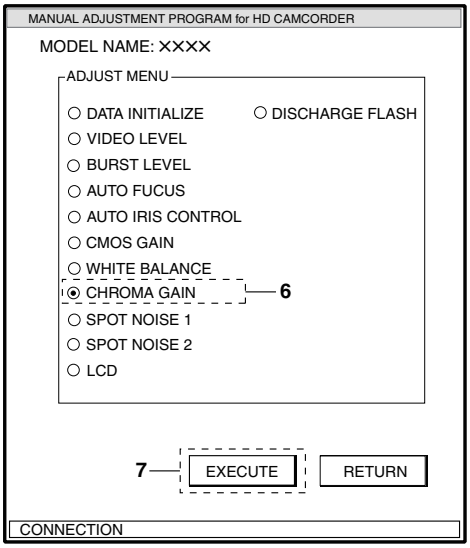


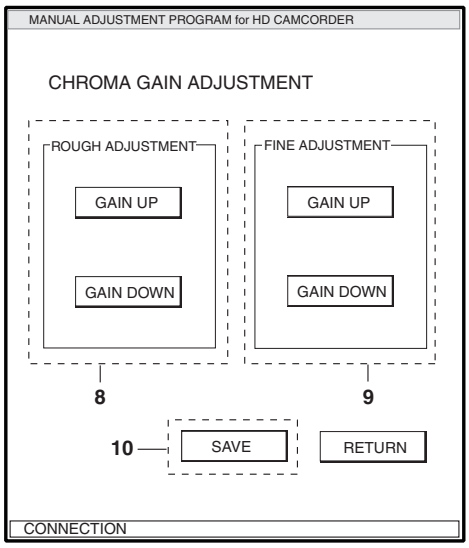
Fig. 6-4-5 Screen when recording the color bar chart

ADJUST MENU screen



6) Choose CHROMA GAIN.
7) Click the EXECUTE button.

CHROMA GAIN ADJUSTMENT screen



8) Click the GAIN UP or GAIN DOWN button in ROUGH ADJUSTMENT box so that the value of red vector or red level approaches that in Table 6-4-1. Click the button at approx. 2-second intervals while checking the increase or decrease of vector or level.

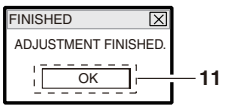
9) Click the GAIN UP or GAIN DOWN button in FINE ADJUSTMENT box so that the value of red vector or red level matches that in Table 6-4-1. Click the button at approx. 2-second intervals while checking any increase or decrease in vector or level.

Table 6-4-1 Value of Red Level/Vector

Model	When using a vectorscope	When using an oscilloscope
DZ-BD7HA	A = 240% ± 5%	B = 686mV ± 20mV
DZ-BD70A		

10) After step 9) is complete, be sure to click the SAVE button.
Note that clicking the RETURN button will restore the ADJUST MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



11) Click the OK button in dialog to restore the ADJUST MENU screen.

12) Press the MENU button on camcorder, and use the joystick (⏮ / ⏭ / ◀◀ / ▶▶) to specify (return to) “White Balance.: Auto”.

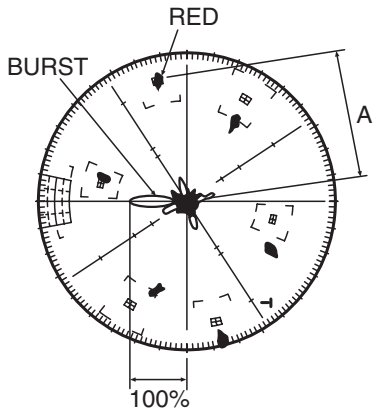


Fig. 6-4-6 When using a vectorscope

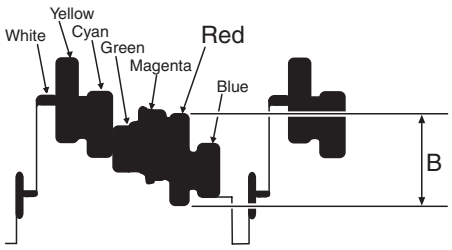
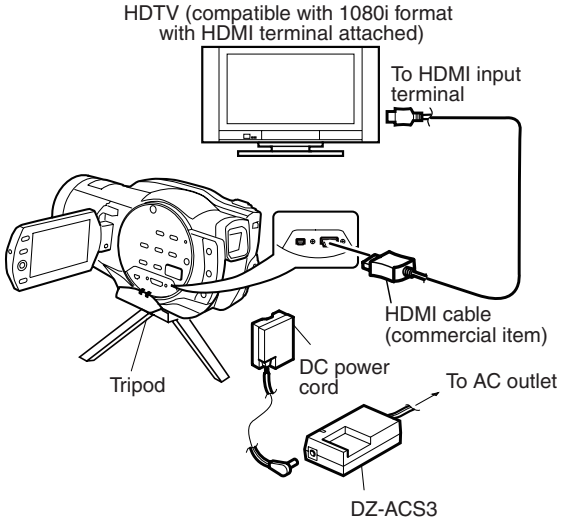


Fig. 6-4-7 When using an oscilloscope

6-4-9 Spot Noise 1 (White spot noise)

Information:

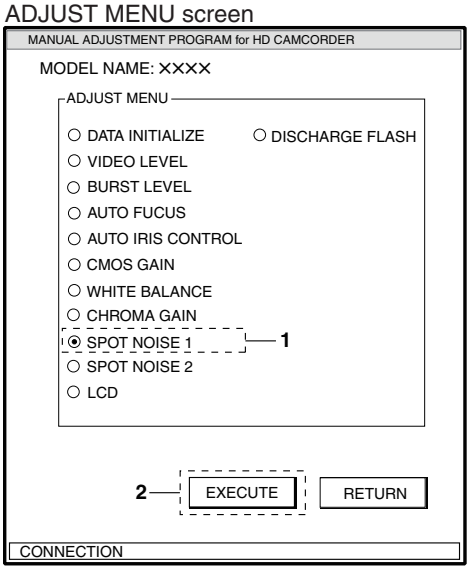
1) The SPOT NOISE 1 adjustment compensates for bright points that appear on the screen, and these are caused by a defect in pixel of image sensor that may occur when camcorder is used under particular conditions or for a long time. Therefore, execute SPOT NOISE 1 only in the following cases:
   a) Pixel defect occurs in image sensor and a bright point appears on screen.
   b) Image sensor is replaced.
   c) "Initial Data Write" is executed
2) The presence or absence of a bright point that appears on screen due to pixel defect on image sensor can easily be judged by capping the lens. Use HDTV (compatible with 1080i format with HDMI terminal attached) for this check.



Connection of HDTV

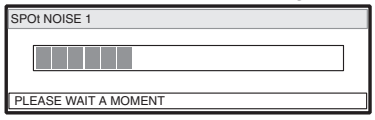
Procedure:

ADJUST MENU screen

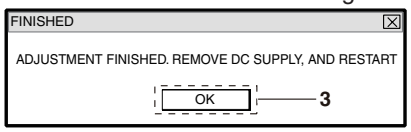


1) Choose SPOT NOISE 1.
2) Click the EXECUTE button to start adjustment.
   Once adjustment has started, the screen may become distorted, but this is normal behavior. The progress status can be confirmed through the Progress Status dialog.

PROGRESS STATUS dialog

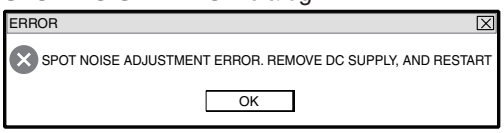


ADJUSTMENT FINISHED dialog



3) Click the "OK" button in the dialog.
   The adjustment software will be terminated automatically when the "OK" button is clicked, so disconnect the DC power cord from the camcorder.
   If a bright spot still spears on the screen after reconnecting the camcorder to the DC power cord and turning on the power supply again, the image sensor may be at fault.

STOP NOISE ERROR dialog



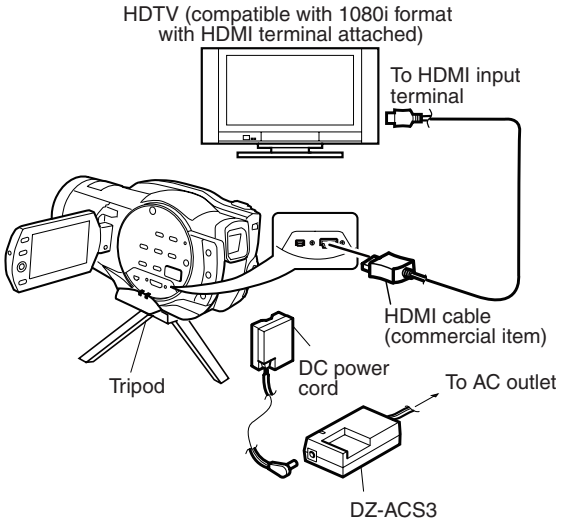
Click the “OK” button in the dialog to display the SPOT NOISE ERROR dialog.
When the “OK” button is clicked, the adjustment software is automatically terminated. Disconnect the DC power cord from the camcorder and perform the following steps.

1) Leave the camcorder for several hours until the temperature goes down.
2) Upon reconnecting the DC power cord to the camcorder that has been left for several hours, set the power switch to “ON” after selecting “HDD” with the power switch of DZ-BD7HA.
3) The setting status can be confirmed by referring to “(1) Setting the Camcorder” of “6-2-4 Settings for Adjustment”
4) Restart the adjustment program to re-adjust the SPOT NOISE 1. If the SPOT NOISE ERROR dialog appears during re-adjustment, the image sensor may be at fault.

6-4-10 Spot Noise 2 (Black Spot Noise)

Information:

1) The SPOT NOISE 2 adjustment compensates for black points that appear on the screen, and these are caused by a defect in pixel of image sensor that may occur when camcorder is used under particular conditions or for a long time.
   Therefore, execute SPOT NOISE 2 only in the following cases:
   a) Pixel defect occurs in image sensor and a black point appears on screen.
   b) Image sensor is replaced.
   c) “Initial Data Write” is executed
2) The presence or absence of black spot noise that appears on the screen due to a pixel defect on the image sensor can be determined by photographing a light box without a chart, filling the entire screen, and checking the image on an HDTV (compatible with 1080i format; includes an HDMI input terminal attached) through an HDMI connection.



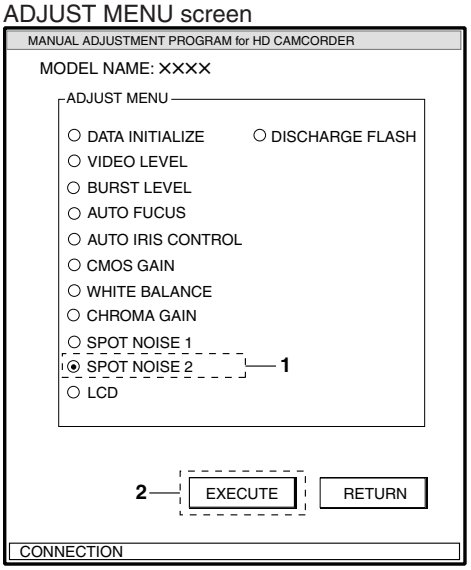
Connection of HDTV

Preparation:

Attach the C12 light balancing filter and point at light box without chart, filling the screen.

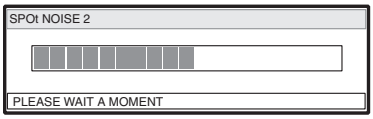
Procedure:

ADJUST MENU screen

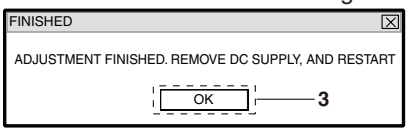


1) Choose SPOT NOISE 2.
2) Click the EXECUTE button to start adjustment.
   Once adjustment has started, the screen may become distorted, but this is normal behavior. The progress status can be confirmed through the Progress Status dialog.

PROGRESS STATUS dialog

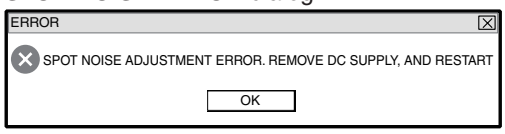


ADJUSTMENT FINISHED dialog



3) Click the “OK” button in the dialog.
   When the “OK” button is clicked, the adjustment software is automatically terminated. Disconnect the DC power cord from the camcorder.
   If a black spot appears on the screen after reconnecting the DC power cord to the camcorder and turning on the power supply again, perform “6-5 Additional Corrections for Black Spot Noise.”

STOP NOISE ERROR dialog



Click the “OK” button in the dialog to display the SPOT NOISE ERROR dialog.
When the “OK” button is clicked, the adjustment software is automatically terminated. Disconnect the DC power cord from the camcorder and perform the following steps.

1) Leave the camcorder for several hours until its temperature goes down.
2) Upon reconnecting the DC power cord to the camcorder that has been left for several hours, set the power switch to “ON” after selecting “HDD” with the power switch of DZ-BD7HA.
3) The setting status can be confirmed by referring to “(1) Setting the Camcorder” of “6-2-4 Settings for Adjustment.
4) Restart the adjustment program to re-adjust the SPOT NOISE 2. If the SPOT NOISE ERROR dialog appears during re-adjustment, the image sensor may be at fault.

6-4-11 LCD

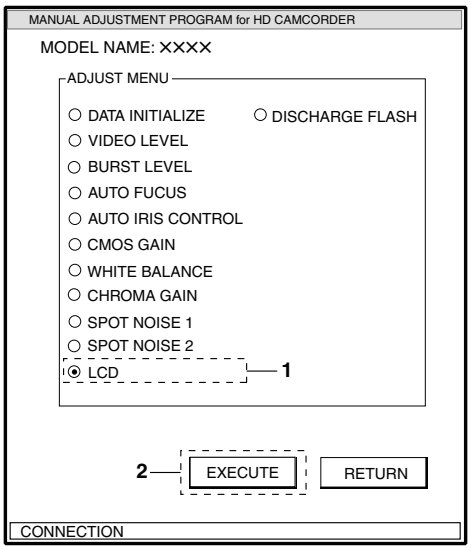
Note:
1) Perform LCD only after replacing the MAN circuit board or LCD unit, or executing “Initial Data Write”.
2) Neither light box nor chart is needed for LCD adjustment.

Before performing any adjustments for LCD, be sure to shift the camcorder to the test mode using the procedure below, and then display the LCD ADJUSTMENT MENU.

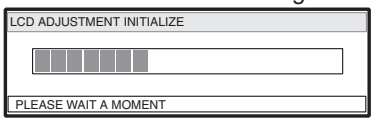
Procedure:
1) Choose LCD on the ADJUST MENU screen.
2) Click the EXECUTE button on ADJUST MENU screen to shift the camcorder to the test mode.
   The progress status can be confirmed using the PROGRESS STATUS dialog.
3) When the camcorder has shifted to the test mode, the LCD screen will be black and white (see Fig. 6-4-8), and the LCD ADJUSTMENT MENU screen will appear on the PC monitor screen.

Fig. 6-4-8 LCD Monitor Screen

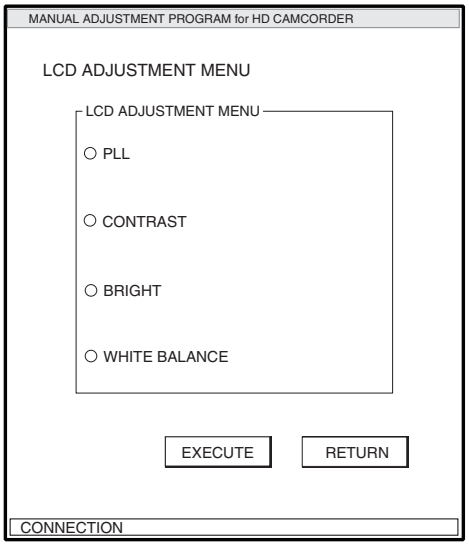
ADJUST MENU screen



PROGRESS STATUS dialog



LCD ADJUSTMENT MENU screen



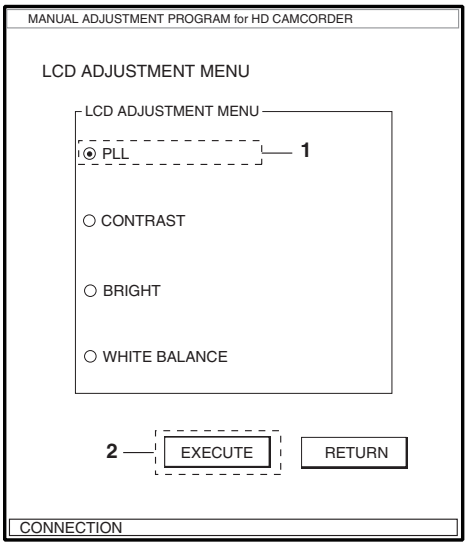
(1) LCD PLL

Preparation:

Connect the frequency counter to "LCD-HDO (pin 11)" of Halcyon connector.

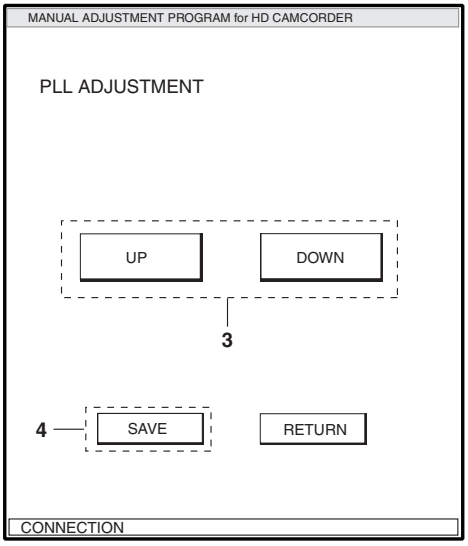
Procedure:

LCD ADJUSTMENT MENU screen



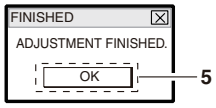
1) Choose PLL.
2) Click the EXECUTE button.
   Synchronization of the video on LCD monitor screen will be off at this time, and the image will flow.

PLL ADJUSTMENT screen.



3) Click the UP or DOWN button so that the frequency is 15.734 kHz ± 0.1 kHz. Click the button at approx. 2-second intervals while checking the variation of frequencies.
4) After step 3) is complete, be sure to click the SAVE button.
   Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

(2) LCD Contrast-1

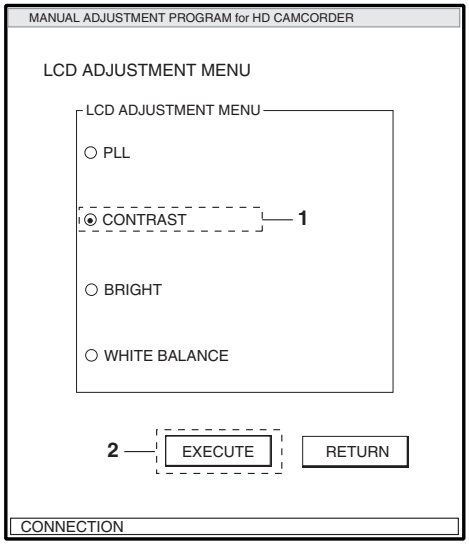
Note:
Be sure to adjust LCD brightness and LCD contrast-2 after completing LCD contrast-1 adjustment.

Preparations:

1) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
2) Switch the oscilloscope V-MODE to "CH2": Leave the TRRIGER SOURCE in "CH1" as is.

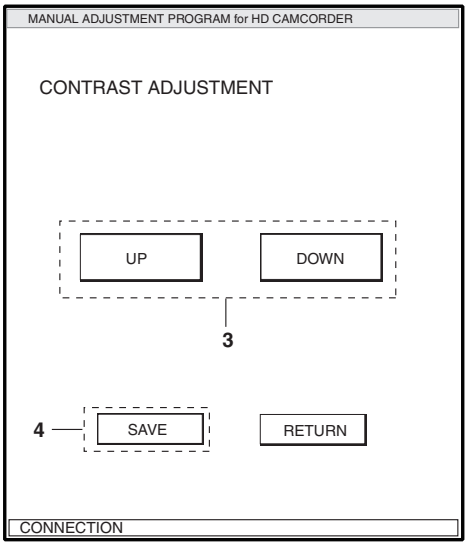
Procedure

LCD ADJUSTMENT MENU screen



1) Choose CONTRAST.
2) Click the EXECUTE.

CONTRAST ADJUSTMENT screen



3) Click the UP or DOWN button so that the value of level A of waveform is 2.15V ± 0.02Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level A.

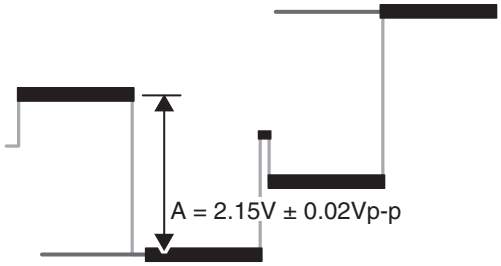
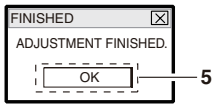


Fig. 6-4-9 Waveform of LCD Contrast-1 Adjustment

4) After step 3) is complete, be sure to click the SAVE button.
Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

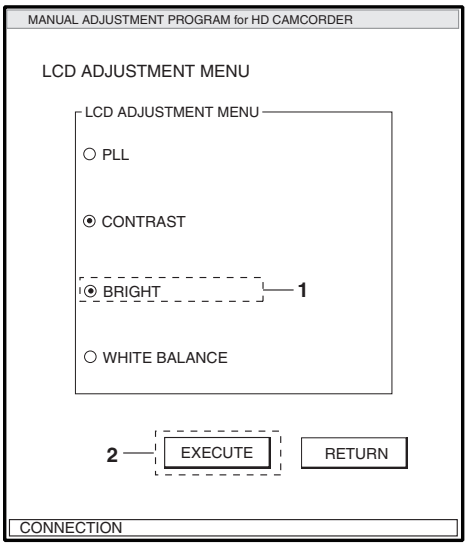
(3) LCD Brightness

Preparations:

1) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
2) Switch the oscilloscope V-MODE to "CH2": Leave the TRRIGER SOURCE in "CH1" as is.

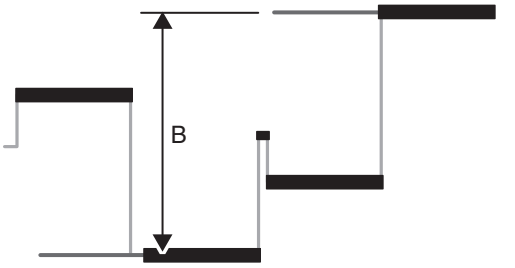
Procedure:

LCD ADJUSTMENT MENU screen



1) Choose BRIGHT.
2) Click the EXECUTE button.

[Before Adjustment]



[After Adjustment]

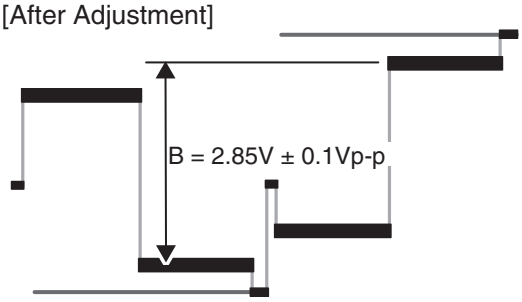
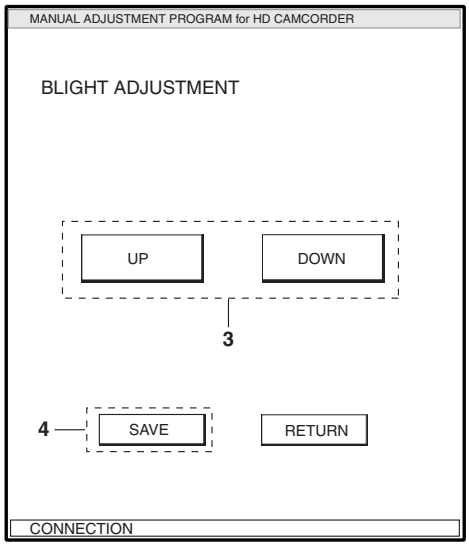


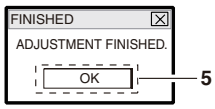
Fig. 6-4-10 Waveform of LCD Bright Adjustment

BRIGHT ADJUSTMENT screen



3) Click the UP or DOWN button so that the value of level B of waveform is 2.85V ± 0.1Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level B.
4) After step 3) is complete, be sure to click the SAVE button.
Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

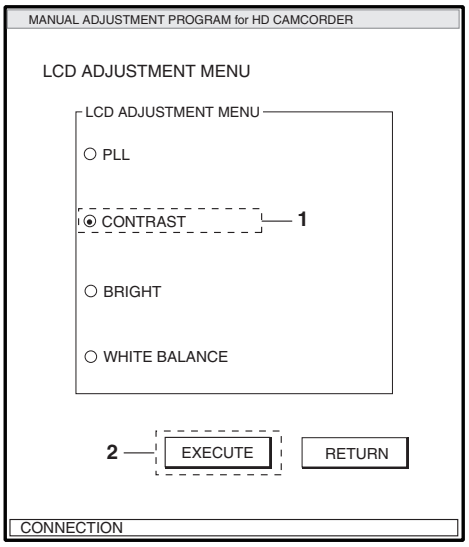
(4) LCD Contrast-2

Preparations:

1) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
2) Switch the oscilloscope V-MODE to "CH2": Leave the TRRIGER SOURCE in "CH1" as is.

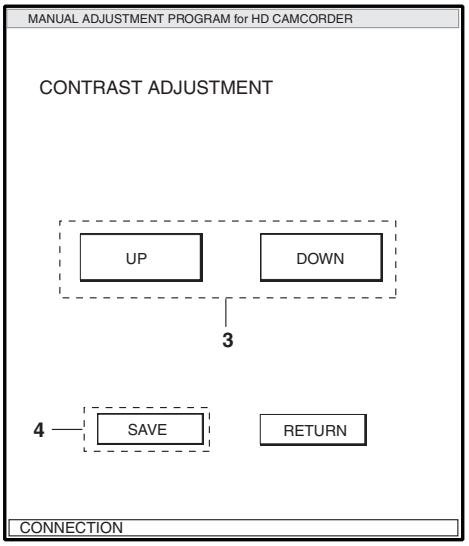
Procedure

LCD ADJUSTMENT MENU screen



1) Choose CONTRAST.
2) Click the EXECUTE button.

CONTRAST ADJUSTMENT screen



3) Click the UP or DOWN button so that the value of level A of waveform is 2.25V ± 0.02Vp-p. Click the button at approx. 2-second intervals while checking any increase or decrease in level A.

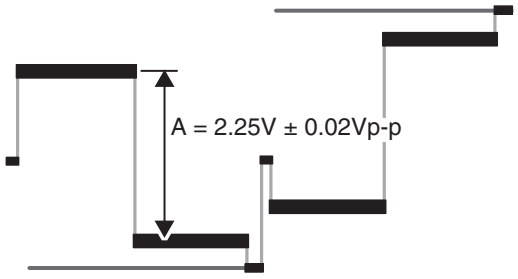
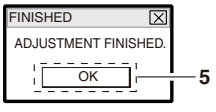


Fig. 6-4-11 Waveform of LCD Contrast-2 Adjustment

4) After step 3) is complete, be sure to click the SAVE button.
Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.

ADJUSTMENT FINISHED dialog



5) Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.

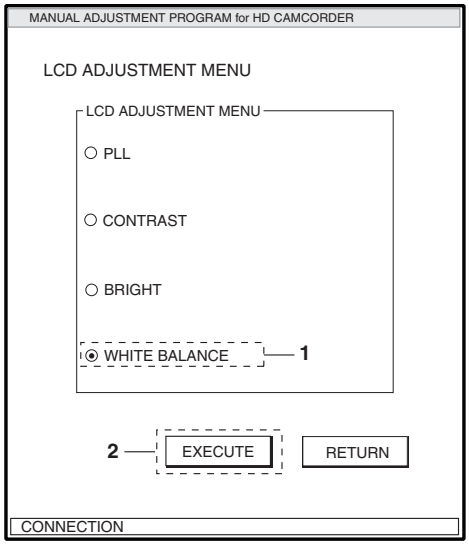
(5) LCD White Balance

Preparations:

1) Connect the oscilloscope CH1 to "LCD-R (pin 14)" of Halcyon connector.
2) Connect the oscilloscope CH2 to "LCD-G (pin 13)" of Halcyon connector.
3) Connect the oscilloscope EXT TRIG to video output.
4) Switch the oscilloscope V-MODE to "ALT" and TRIGGER SOURCE to "EXT".
5) Set the switches and knobs on oscilloscope so that the CH1 and CH2 waveforms appear as shown in Fig. 6-4-12.

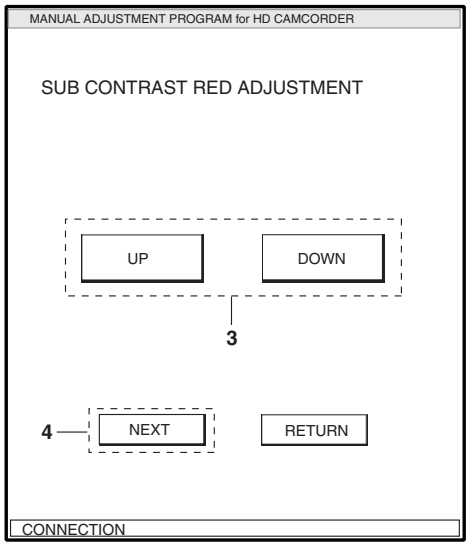
Procedure

LCD ADJUSTMENT MENU screen



1) Choose WHITE BALANCE.
2) Click the EXECUTE button.

SUB CONTRAST RED ADJUSTMENT screen.



3) Click the UP and DOWN buttons so that level a of CH1 waveform is equal to level b of CH2 waveform. Click the button at approx. 2-second intervals while checking any increase or decrease in level a.

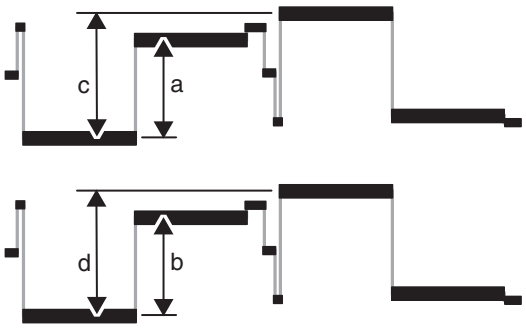
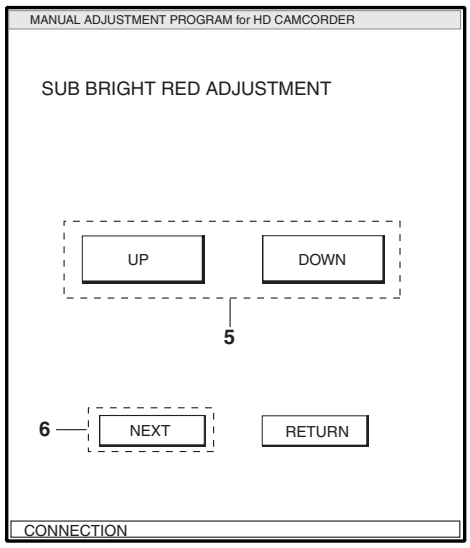


Fig. 6-4-12 Waveform of LCD White Balance Adjustment

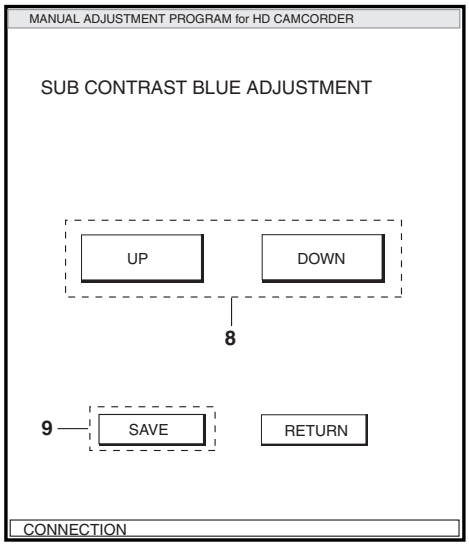
4) After step 3) is complete, be sure to click the NEXT button.
Note that clicking the RETURN button will restore the LCD ADJUSTMENT MENU screen to the status before the adjustment was performed.

SUB BRIGHT RED ADJUSTMENT screen.



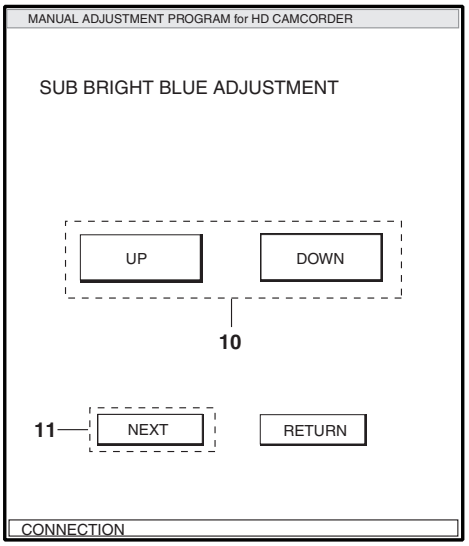
5) Use the same procedure as in step 3) to equalize levels c and d of the waveform.
6) After step 5) is complete, be sure to click the NEXT button.
7) Connect the oscilloscope CH1 to "LCD-B (pin 12)" of Halcyon connector.

SUB CONTRAST BLUE ADJUSTMENT screen.



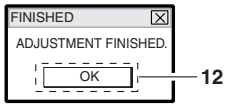
8) Use the same procedure as in step 3) to equalize levels a and b of the waveform. (See Fig. 6-4-12)
9) After step 8) is complete, be sure to click the NEXT button.

SUB BRIGHT BLUE ADJUSTMENT screen.



10) Use the same procedure as in step 3) to equalize levels c and d of the waveform.
11) After step 10) is complete, be sure to click the SAVE button.

ADJUSTMENT FINISHED dialog



12) Click the OK button in dialog to restore the LCD ADJUSTMENT MENU screen.
13) Click the RETURN button in LCD ADJUSTMENT MENU to restore the ADJUST MENU screen.

6-5 Additional Corrections for Black Spot Noise

6-5-1 Procedure for Additional Corrections for Black Spot Noise

After necessary adjustments have been made according to "6-4 Adjustment Procedures," perform "Additional Corrections for Black Spot Noise" as needed while referring to the Confirmation Flowchart in the following Figure.

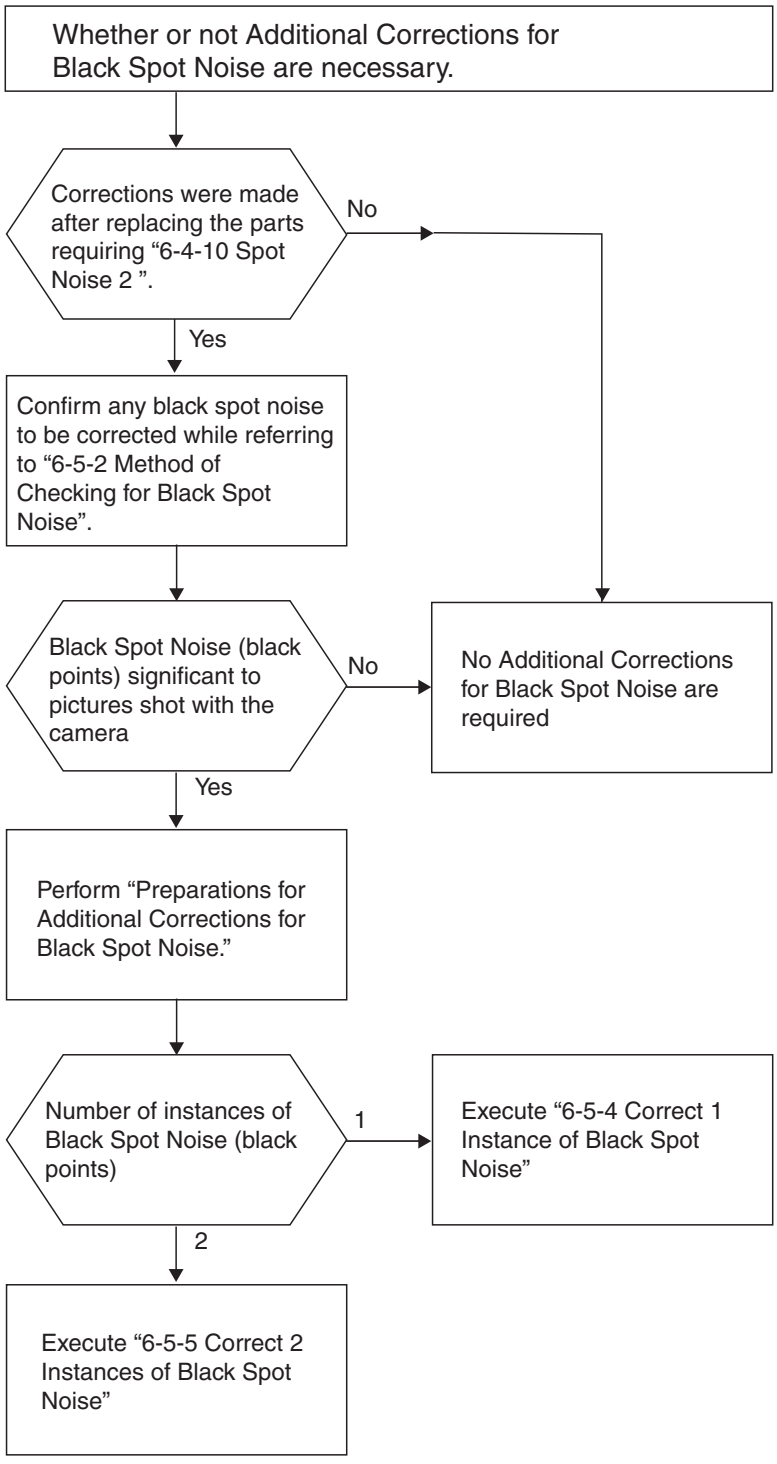

Whether or not Additional Corrections for Black Spot Noise are necessary.
Corrections were made after replacing the parts requiring "6-4-10 Spot Noise 2 ".
No
Yes
Confirm any black spot noise to be corrected while referring to "6-5-2 Method of Checking for Black Spot Noise".
Black Spot Noise (black points) significant to pictures shot with the camera
No
No Additional Corrections for Black Spot Noise are required
Yes
Perform "Preparations for Additional Corrections for Black Spot Noise."
Number of instances of Black Spot Noise (black points)
1
Execute "6-5-4 Correct 1 Instance of Black Spot Noise"
2
Execute "6-5-5 Correct 2 Instances of Black Spot Noise"

Fig. 6-5-1 Confirmation Flowchart for Additional Corrections for Black Spot Noise

6-5-2 Method of Checking for Black Spot Noise

(1) Jigs and Tools used for Checking

For details on the following jigs and tools (other than the HDMI cable), refer to "6-1-2 List of jigs and tools used when creating reference data."

1) DZ-ACS3
2) Power supply cord
3) DC Power cord
4) HDMI Cable (commercial item)

(2) Power supply/chart, etc. for checking

1) HDTV (compatible with 1080i format with an HDMI input terminal attached)
2) 3100 K light box

(3) Connections for checking

Connect the camcorder, jigs and tools, and test equipment as shown in Figure 6-5-2.

Caution

It is very dangerous to perform any work with the camcorder disassembled because the camcorder has a laser-emitting block and a built-in high-voltage circuit.

1) Use a light box whose color temperature and luminance are sufficiently controlled with no flickering. Using an inappropriate light box will interfere with checking operations.
2) Set the light box 30-50 cm away from the camcorder and keep the lens surface and the surface of light of the light box as horizontal as possible.
3) Use a small tripod to fix the camcorder, making certain it does not move during operation.

Information:

1) During HDMI connection, the camcorder will not output any sound except during replay time.
2) Make sure to use a HDTV (compatible with 1080i format with an HDMI input terminal attached) for the monitor used to check for Black Spot Noise.
   Black spot noise (black points) that may not be noticeable on a color monitor (TV) screen of standard picture quality may be noticeable on a HDTV monitor.

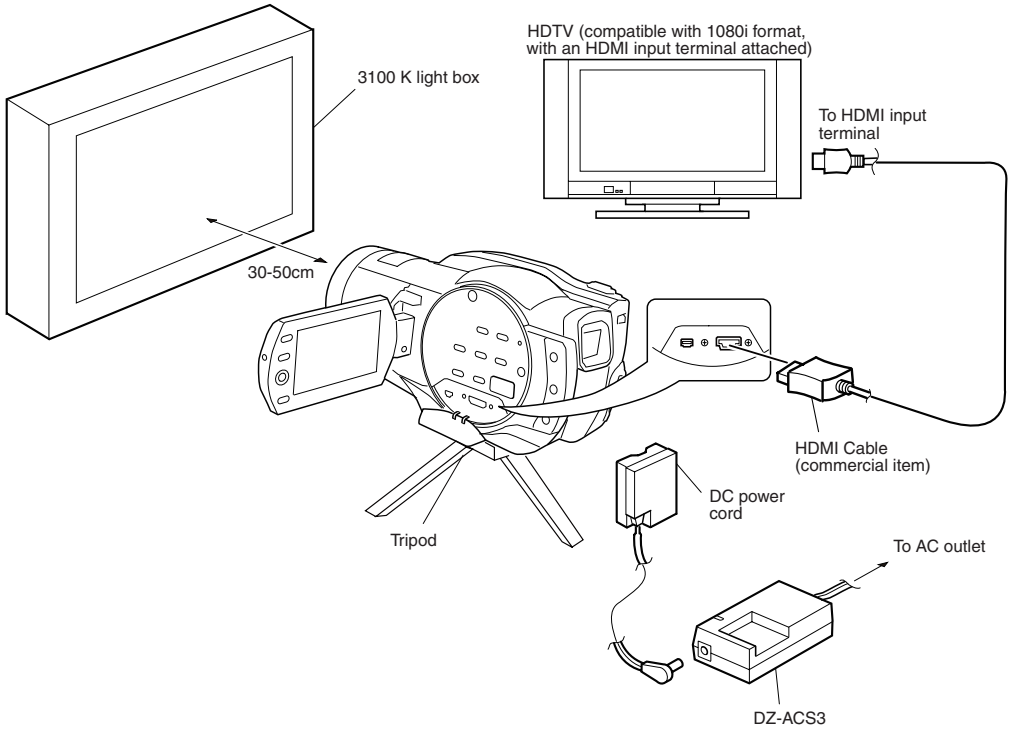


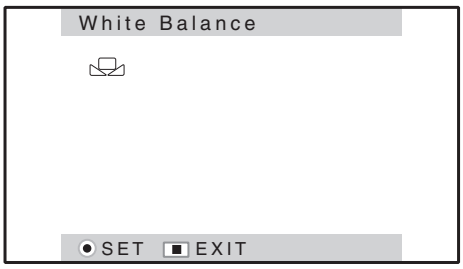
Fig. 6-5-2 Connections for checking for Black Spot Noise

(4) Setting the Camcorder

After completing the connections for checking, set the camcorder according to the following steps.

1) Make sure that the BD/DVD and card are not attached.
   Checking for Black Spot Noise does not require the BD/DVD and card.
2) Set the Movie/Still Select switch to “Movie”.
3) After selecting “HDD” with the power switch, set the power switch to “ON” for DZ-BD7HA.
   For subsequent operations, operate while watching the LCD monitor.
4) Set the zoom to the Tele end (telephoto end of optical zoom) or the location where the digital zoom zone starts so that the focus will not be on the light box.
   Focusing on the light box makes it difficult to distinguish between dust on the light box and Black Spot Noise (black points).
5) Press the menu button to display the menu screen.
6) Select “Initial Setup” with the joystick (⏮ / ⏭ / ◀◀ / ▶▶) and press the joystick straight down.
7) Select “Reset” with the joystick and press the joystick straight down to display the Reset Settings Confirmation screen.
8) Select “Yes” with the joystick and reset the settings by pressing the joystick straight down.
9) Upon completion of resetting, operate the joystick in the above-mentioned manner to set the “EIS” and the “Digital Zoom” in the Camera Function Setup to “OFF”, and “Demo Mode” to “OFF” in the Initial Setup.
   Failure to set these items to “OFF” may result in a fault during confirmation.

10) Operate the joystick in the above-mentioned manner to manually set “White Balance” to “Set” according to the following steps.
Upon setting to “Set,” the White Balance Set screen will appear and the mark on the screen will flash. Hold down the joystick until the mark changes from flashing and lights up.
11) Press the Menu button to restore the normal display.
12) With the following button operation, change the entire screen display to Hide display.
Press the Select, Record, and Quick Start buttons simultaneously.



White Balance Set screen

Information:
The conditions after performing the settings in this section are made are shown in the following table.
The setting details for the dating function are omitted because it does not affect the checking operation.
Furthermore, items that are displayed only when BD/DVD is attached or Still is selected are also omitted.

Item	Setting
Camera Functions Setup	
Program AE	Auto
White Balance	Set
EIS	Off
Digital Zoom	Off
MIC Filter	Off
Recording Functions Setup	
HD Video Mode	HX
LCD/EVF Setup	
LCD Brightness	
EVF Brightness	
Color Level	
EVF Display	Auto

Item	Setting
Initial Setup	
Beep	On
Power Save	Off
Record LED	On
Language	English
Demo Mode	Off

(5) Checking for Black Spot Noise

Check for any black spot noise (black point) significant to images recorded by camera in the HDTV screen by executing the connections and settings properly.
If there is no black spot noise (black points), the following procedure is not necessary.
If there is 1 instance of black spot noise, perform “6-5-4 Correct 1 Instance of black spot noise.” If there are 2 instances of Black Spot Noises, perform “6-5-5 Correct 2 Instances of Black Spot Noise,” after performing “6-5-3 Preparations for Additional Corrections for Black Spot Noise.”

6-5-3 Preparations for Additional Corrections for Black Spot Noise

Execute only when there is any Black Spot Noise (black point) that must be corrected after performing “6-5-2 Method of Checking for Black Spot Noise.”

(1) Jigs and Tools for Additional Correction

For details on jigs and tools (other than PC, software for Additional Corrections for Black Spot Noise, and HDMI cable), refer to "6-1-2 List of jigs and tools used when creating reference data."

1) PC (OS: Windows 2000 Professional/XP Home Edition/XP Professional)
2) Software for Additional Corrections for Black Spot Noise
   (compatible OS: only Windows 2000 Professional/XP Home Edition/XP Professional)
3) Halcyon Connector
4) DSP-R Jig
5) RS-232C Cable
6) DZ-ACS3
7) Power Cord
8) DC Power Cord
9) HDMI Cable (commercial item)

Information:
The software for Additional Corrections for Black Spot Noise is different from the adjustment software that is copied to the PC by performing “5-2-1 Copying/Removal Adjustment Software” or “6-1-6 Copying or Deleting Adjustment Software.”
Referring to the later procedure “(5) Installing Software for Additional Corrections for Black Spot Noise,” install on your PC (OS: Windows 2000 Professional/XP Home Edition/XP Professional).

(2) Power supply/chart, etc. to perform additional corrections

1) HDTV (compatible with 1080i format, with an HDMI input terminal attached)
2) 3100 K light box
3) DC power supply (5V/1A) for DSP-R jig

(3) Connections for performing Additional Corrections

Connect the camcorder, jigs and tools, and test equipment as shown in Figure 6-5-3.

Caution

It is very dangerous to perform any work with the camcorder disassembled because the camcorder has a laser-emitting block and a built-in high-voltage circuit.

1) Use a light box whose color temperature and luminance are sufficiently controlled with no flickering. Using an inappropriate light box will interfere with the checking operation.
2) Set the light box 30-50 cm away from the camcorder and keep the lens surface and the surface of light of the light box as horizontal as possible.
3) Use a small tripod to fix the camcorder, making certain it does not move during work.

Note:

1) During HDMI connection, the camcorder will not output any sound except during replay time
2) Make sure to use a HDTV (compatible with 1080i format with an HDMI input terminal attached) for the monitor used to check for Black Spot Noise.
   Black spot noise (black points) that may not be noticeable on a color monitor (TV) screen of standard picture quality may be noticeable on a HDTV monitor.

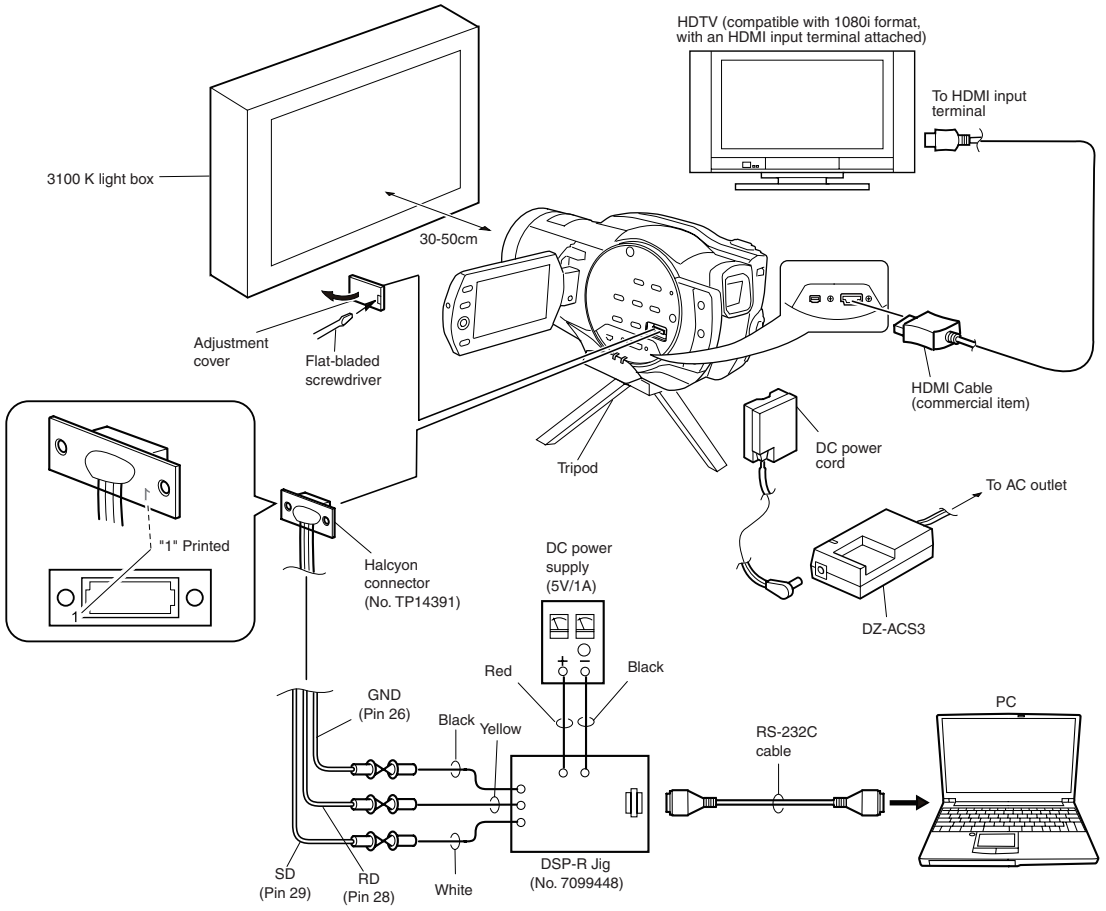


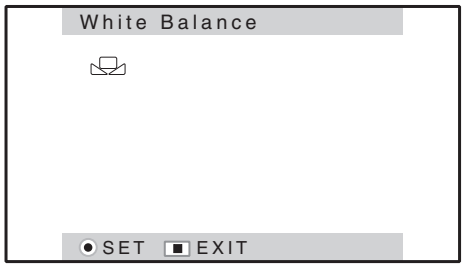
Fig. 6-5-3 Connections for Additional Corrections for Black Spot Noise

(4) Camcorder Settings

After completing the connections for Additional Corrections, set the camcorder according to the following steps.

The following setting details are the same as those used for the previously described Black Spot Noise Confirmation.

1) Make sure that the BD/DVD and card are not attached.
   Additional Corrections for Black Spot Noise do not require the BD/DVD and card.
2) Set the Movie/Still Select switch to "Movie."
3) After selecting "HDD" with the power switch, set the power switch to "ON" for DZ-BD7HA.
   For subsequent operations, operate while watching the LCD monitor.
4) Set the zoom to the Tele end (telephoto end of optical zoom) or the location where the digital zoom zone starts so that the focus will not be on the light box.
   Focusing on the light box makes it difficult to distinguish between dust on the light box and Black Spot Noise (black points).
5) Press the menu button to display the menu screen.
6) Select "Initial Setup" with the joystick (⏮ / ⏭ / ◀◀ / ▶▶) and press the joystick straight down.
7) Select "Reset" with the joystick and press the joystick straight down to display the Reset Settings Confirmation screen.
8) Select "Yes" with the joystick and reset the settings by pressing the joystick straight down.
9) Upon completion of resetting, operate the joystick in the above-mentioned manner to set the "EIS" and the "Digital Zoom" in the Camera Function Setup to "OFF", and "Demo Mode" to "OFF" in the Initial Setup.
   Failure to set these items to "OFF" may result in a fault during confirmation.
10) Operate the joystick in the above-mentioned manner to manually set "White Balance" to "Set" according to the following steps.
    Upon setting to "Set," the White Balance Set screen will appear and the mark on the screen will flash. Hold down the joystick until the mark changes from flashing and lights up.
11) Press the Menu button to restore the normal display.
12) With the following button operation, change the entire screen display to Hide display.
    Press the Select, Record, and Quick Start buttons simultaneously.



White Balance Set screen

Information:

The conditions after performing the settings in this section are made are shown in the following table.

The setting details for the dating function are omitted because it does not affect the checking operation.

Furthermore, items that are displayed only when BD/DVD is attached or Still is selected are also omitted.

Item	Setting
Camera Functions Setup	
Program AE	Auto
White Balance	Set
EIS	Off
Digital Zoom	Off
MIC Filter	Off
Recording Functions Setup	
HD Video Mode	HX
LCD/EVF Setup	
LCD Brightness	
EVF Brightness	
Color Level	
EVF Display	Auto

Item	Setting
Initial Setup	
Beep	On
Power Save	Off
Record LED	On
Language	English
Demo Mode	Off

(5) Install Software for Additional Corrections for Black Spot Noise

Information:

1) The software for Additional Corrections of Black Spot Noise is different from the adjustment software. Refer to the following installation procedure.
2) The language and the characters on the PC screen during installation may vary depending on the language settings of the OS. Therefore, text is represented by the character “x” in this document.
3) Characters on the PC screen may be garbled during installation. However, installation can be conducted normally.

1) Start your PC.
2) Start Explorer and create a new folder in the HDD of the PC.
   Although “Spot Noise” is recommended for the folder name, you may use a similar name that is easy to understand if another folder with the same name already exists.

Note:

The software for Additional Corrections for Black Spot Noise must be managed in a different folder from the adjustment software.

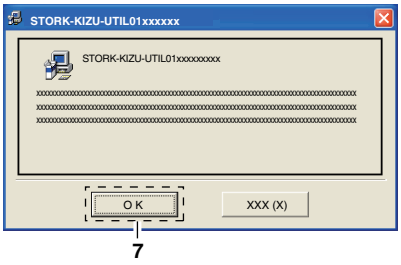
Managing them in the same folder may cause problems during adjustment.

3) Decompress the obtained software for additional corrections for Black Spot Noise. Software for additional corrections for Black Spot Noise is usually compressed in either LZH or ZIP format.

4) Copy all the decompressed folders and files into the MAP07HD folder.
5) Shut down any other applications that are running.
6) Double-click the “setup.exe” file in the “Spot Noise” folder.

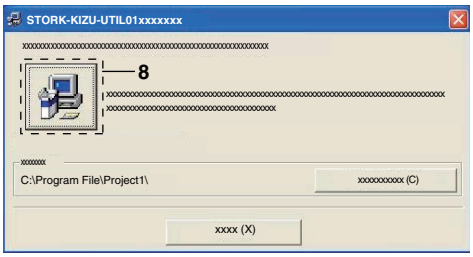
Setup Confirmation screen

7) In the Setup Confirmation screen that appears, click the “OK” button on the screen.



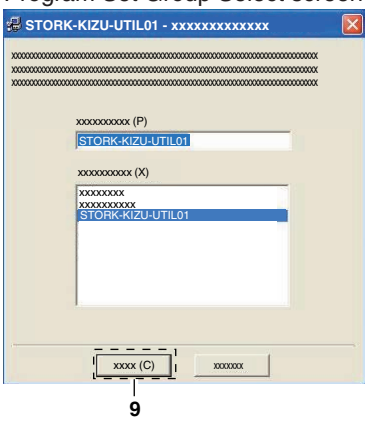
Setup Start screen

8) In the Setup Start screen that appears, click the button with the picture of a PC.



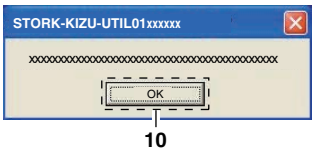
Program Set Group Select screen

9) Click the “Continue” button if the Program Group Select screen appears.



Setup Completed screen

10) Upon completion of installation, the Setup Completion screen will appear. Click the “OK” button.



Information:
When uninstalling the software for Additional Corrections for Black Spot Noise, open “Add or Remove Software” using any of the following procedures from the “Start” button in Windows and remove the software for Additional Corrections for Black Spot Noise
After removal, delete the “Spot Noise” (or equivalent) folder created during installation.
a) “Start” → “Control Panel” → “Add or Remove Software”
b) “Start” → “Setting” →”Control Panel” → “Add or Remove Software”

(6) Start Software for Additional Corrections for Black Spot Noise

Make sure that the power switch of the camcorder is “ON” (and DZ-BD7HA is set to HDD mode) and that power is being supplied to the DSP-R jig, and that the connections for the software for additional corrections are set properly.

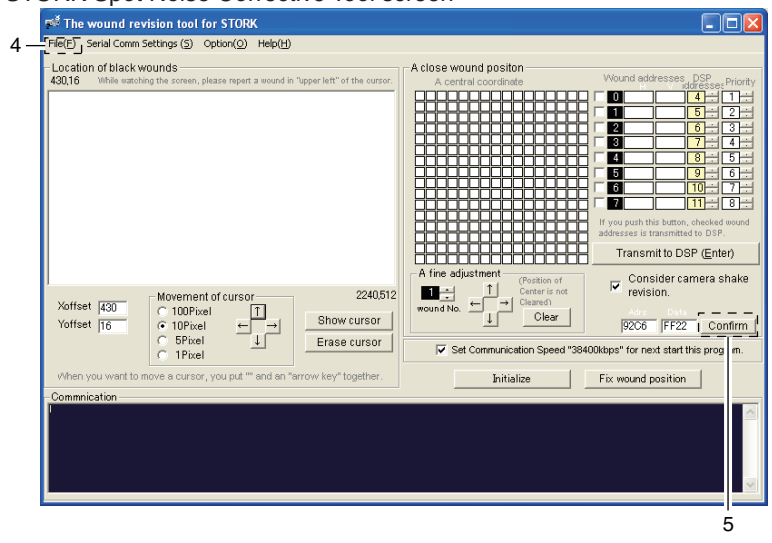
The software for Additional Corrections for Black Spot Noise will not start unless the connections for the additional corrections are made correctly and power is being supplied to the camcorder and the DSP-R jig.

Perform the following operations while watching the PC monitor screen.

> Information:
> The “Correction Tool Screen for STORK Spot Noise” and the “Writing EEPROM Screen” are described to show the work procedure and the locations of buttons.
> Therefore, the displayed contents such as numerical values, symbols, and correction dot addresses, may differ from the screens used for actual operation.

1) Start your PC. If your PC has already been started, shut down any other running applications.
2) Open the “STORK-KIZU-UTIL01” folder and double-click “STORK-KIZU-UTIL01” to open and start the software for Additional Corrections for Black Spot Noise.
   “Start” → “All Programs” or “Programs” → “STORK-KIZU-UTIL01”
3) When the software starts, the Additional Correction Tool screen for STORK Spot Noise will appear.
   If the message “Read from the ADR file?” appears before the Additional Correction Tool screen for STORK Spot Noise appears, select “No.”

STORK Spot Noise Corrective Tool screen

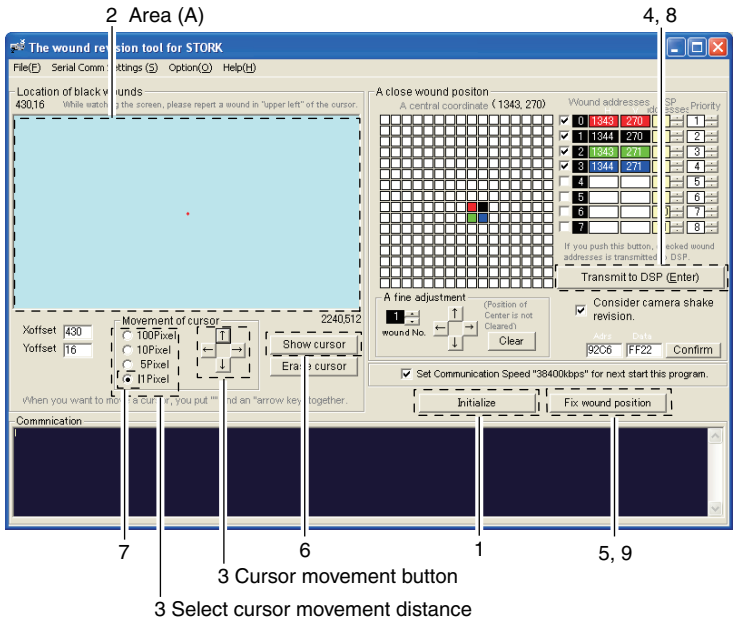


4) Read from the ADR File.
   Click “File (F)” in the Additional Correction Tool screen for STORK Spot Noise and select “Read from ADR File (R).”
   Select the ADR file (the file whose extension is ADR) for the relevant model for adjustment from the installed folder (suggested name: Spot Noise).
   DZ-BD7HA/BD70A: STK50121.ADR

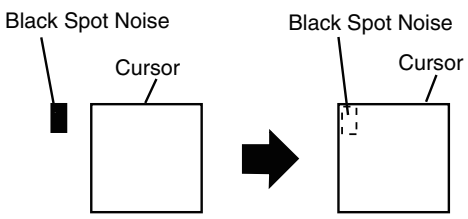
5) Click the “Confirm” button.
Make sure that the English coding sign next to the button reads “FF20” or “FF22”. If it reads anything other than “FF20” or “FF22”, update the firmware or obtain the latest software for additional corrections.
For subsequent operations, depending on the number of instances of Black Spot Noise (black points), refer to either “6-5-4 Correct 1 Instance of Black Spot Noise,” or “6-5-5 Correct 2 Instances of Black Spot Noise,”

6-5-4 Correct 1 Instance of Black Spot Noise

STORK Spot Noise Corrective Tool screen



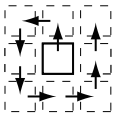
1) Click the “Initialize” button.
2) Display the curser close to the Black Spot Noise (black point) on the HDTV screen.
Click your mouse on the appropriate location in the area (A) on the Additional Correction Tool screen. The area (A) and the HDTV screen are linked. If you click on the upper right corner, the cursor will be displayed on the upper right corner on the HDTV screen. If you click the area (A), the cursor will be displayed in the center of the HDTV screen.
3) Move the cursor so that the Black Spot Noise is hidden under the upper left corner of the cursor, as shown in the figure on the right.
The cursor can be moved by clicking the cursor movement button, and the distance of movement per each click can be set in Select Cursor Movement Distance.
Select “1 pixel” in areas near the Black Spot Noise.



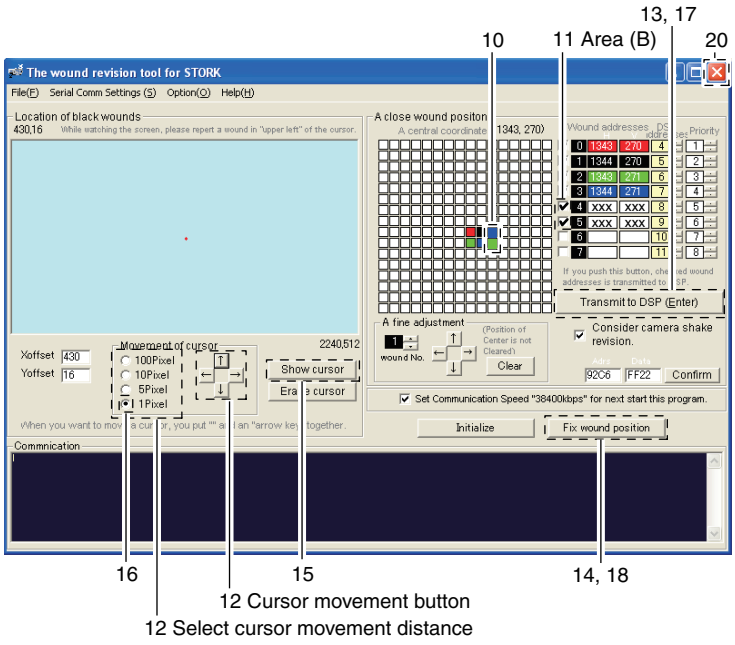
4) Click the “Transmit to DSP (Enter)” button to erase the cursor from the HDTV screen.

5) Confirm that the Black Spot Noise has been corrected and is not noticeable.
   When the Black Spot Noise has been corrected, click the “Fix wound position” button and proceed to step 19.
   If the Black Spot Noise cannot be corrected, proceed to step 6.
6) Click the “Show cursor” button to re-display the cursor on the HDTV screen.
7) Select “1 pixel” in Select Cursor Movement Distance and make slight adjustments to the location of the cursor with the cursor movement button.
8) Click the “Transmit to DSP (Enter)” button to erase the cursor from the HDTV screen.
9) Confirm that the Black Spot Noise has been corrected and is not noticeable.
   When the Black Spot Noise has been corrected, click the “Fix wound position” button and proceed to step 19.
   If the Black Spot Noise cannot be corrected, perform the steps 6 through 8 for 8 times (*1). If this does not work, proceed to step 10.

*1: As shown in the Figure on the right, make slight adjustments by moving the cursor in a total of 8 directions (left, right, up, down, and diagonally) once each time, using the initial location as the center.



STORK Spot Noise Corrective Tool screen

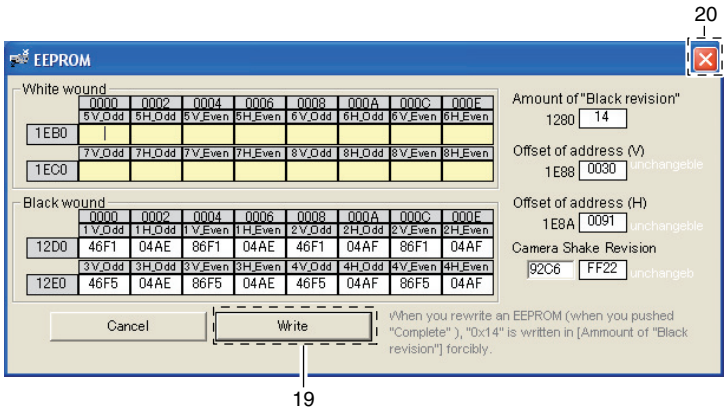


10) Increase the number of surrounding corrective dots.
    As shown in the above Figure, while referring to the section “A close wound position”, add 2 surrounding corrective dots to the right side of the dot that is currently displayed.
11) As shown in the above Figure, click the area (B) to display the check mark.
12) Move the cursor so that the Black Spot Noise is hidden under the upper left corner of the cursor.
    The cursor can be moved by clicking the cursor movement button, and the distance of movement per each click can be set in Select Cursor Movement Distance.
13) Click the “Transmit to DSP (Enter)” button to erase the cursor from the HDTV screen.

14) Confirm that the Black Spot Noise has been corrected and not noticeable.
When the Black Spot Noise has been corrected, click the “Fix wound position” button and proceed to step 19.
If the Black Spot Noise cannot be corrected, proceed to step 15
15) Click the “Show cursor” button to re-display the cursor on the HDTV screen.
16) Select “1 pixel” in the Select Cursor Movement Distance and make slight adjustments to the location of the cursor with the cursor movement button.
17) Click the “Transmit to DSP (Enter)” button to erase the cursor from the HDTV screen.
18) Confirm that the Black Spot Noise has been corrected and is not noticeable.
When the Black Spot Noise has been corrected, click the “Fix wound position” button and proceed to step 19.
If the Black Spot Noise cannot be corrected, perform steps 15 through 17 for 8 times (*1). If this does not work, proceed to step 20, and after completing the additional corrections, replace the sensor pair.

*1: As shown in the Figure on the right, make slight adjustments by moving the cursor in a total of 8 directions (left, right, up, down, and diagonally) once each time, using the initial location as the center.

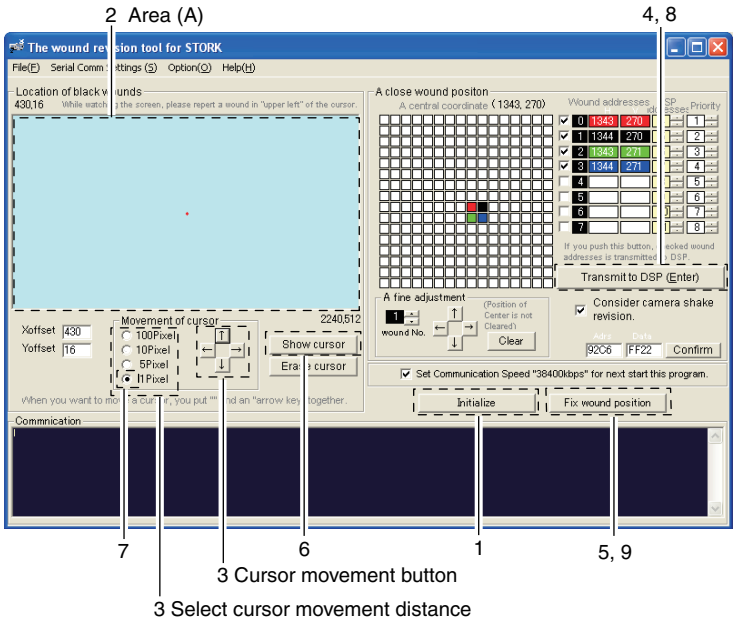
Write to EEPROM screen


20
EEPROM
White wound
0000 0002 0004 0006 0008 000A 000C 000E
5V_Odd 5H_Odd 5V_Even 5H_Even 6V_Odd 6H_Odd 6V_Even 6H_Even
1EB0
7V_Odd 7H_Odd 7V_Even 7H_Even 8V_Odd 8H_Odd 8V_Even 8H_Even
1EC0
Black wound
0000 0002 0004 0006 0008 000A 000C 000E
1V_Odd 1H_Odd 1V_Even 1H_Even 2V_Odd 2H_Odd 2V_Even 2H_Even
12D0 46F1 04AE 86F1 04AE 46F1 04AF 86F1 04AF
3V_Odd 3H_Odd 3V_Even 3H_Even 4V_Odd 4H_Odd 4V_Even 4H_Even
12E0 46F5 04AE 86F5 04AE 46F5 04AF 86F5 04AF
Amount of "Black revision"
1280 14
Offset of address (V)
1E88 0030
Offset of address (H)
1E8A 0091
Camera Shake Revision
92C6 FF22
Cancel
Write
When you rewrite an EEPROM (when you pushed "Complete"), "0x14" is written in [Ammount of "Black revision"] forcibly.
19

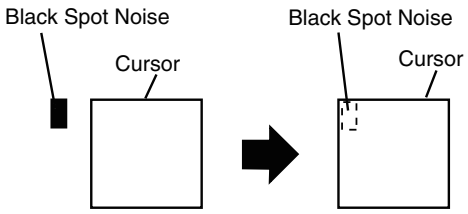
19) Click the “Write” button on the “Write to EEPROM” screen, which is displayed after clicking the “Fix wound position” button, to write the corrected location into the EEPROM.
20) Exit the adjustment software by clicking the “Close” buttons on the STORK Spot Noise Corrective Tool screen and the Write to EEPROM screen.
21) Turn off the camcorder and restore power to check if the black spot noise has been corrected. Otherwise, repeat this procedure again. If it still cannot be corrected, replace the image sensors.

6-5-5 Correct 2 Instances of Black Spot Noise

STORK Spot Noise Corrective Tool screen



1) Click the “Initialize” button
2) Display the curser close to the Black Spot Noise (black point) on the HDTV screen.
   Click your mouse on the appropriate location in the area (A) in the Additional Correction Tool screen.The area (A) and the HDTV screen are linked. If you click on the upper right corner, the cursor will be displayed on the upper right corner on the HDTV screen. If you click the area (A), the cursor will be displayed in the center of the HDTV screen.
3) Move the cursor so that the Black Spot Noise is hidden under the upper left corner of the cursor, as shown in the figure on the right.
   The cursor can be moved by clicking the cursor movement button, and the distance of movement per each click can be set in Select Cursor Movement Distance.
   Select “1 pixel” in areas near the Black Spot Noise.

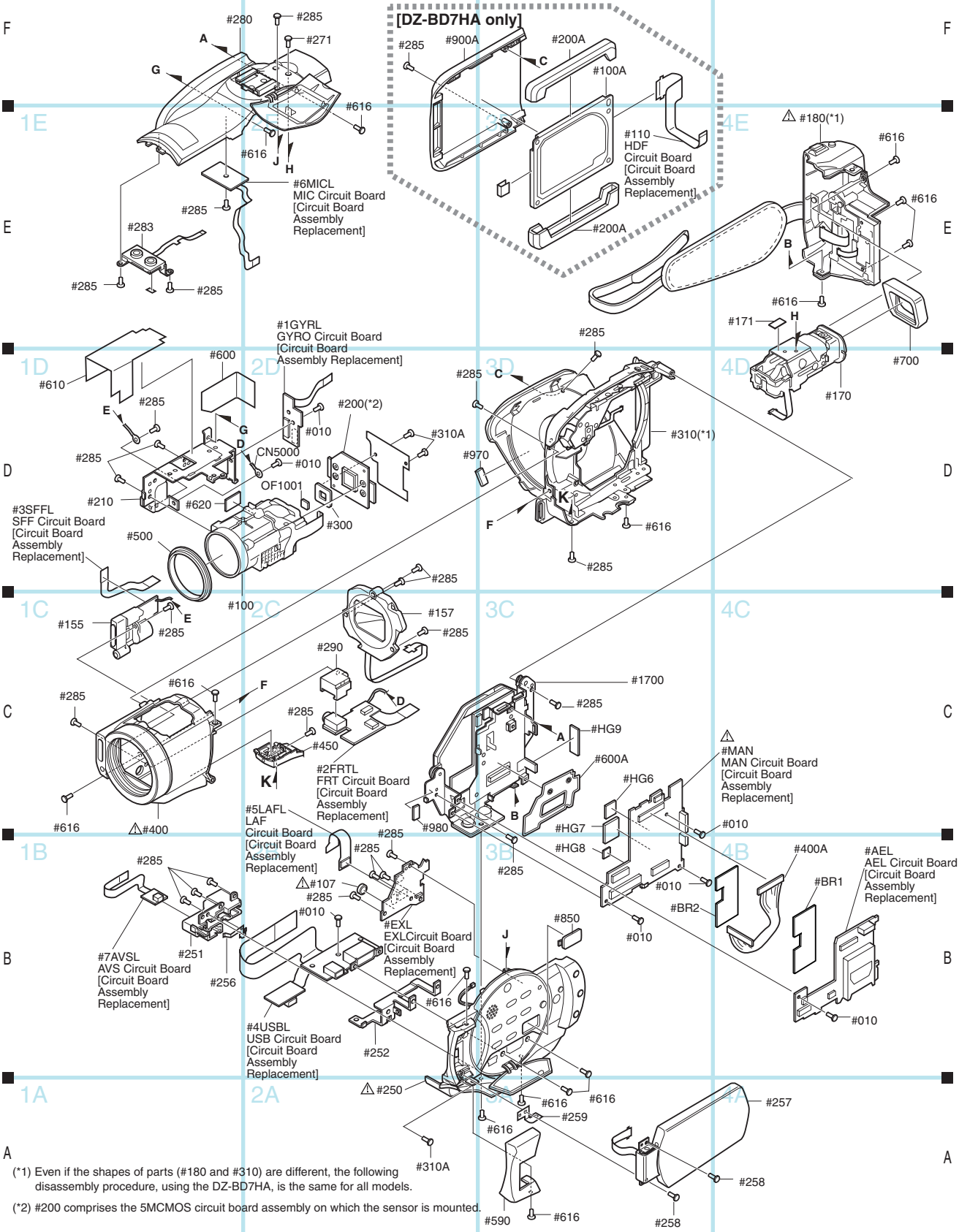


4) Click the “Transmit to DSP (Enter)” button to erase the cursor from the HDTV screen.
5) Confirm that the Black Spot Noise has been corrected and is not noticeable.
   When the Black Spot Noise has been corrected, click the “Fix wound position” button and proceed to step 10.
   If the Black Spot Noise cannot be corrected, proceed to step 6.
6) Click “Show cursor” button to re-display the cursor on the HDTV screen.
7) Select “1 pixel” in the Select Cursor Movement Distance, and adjust slightly the location of the cursor with the cursor go button.
8) Click the “Transmit to DSP (Enter)” button to erase the cursor from the HDTV screen.

7 Exploded View

7-1 DZ-BD7HA/BD70A

Note: Components without any numbers in exploded views had not been assigned as service parts as of the date of issue of this manual.

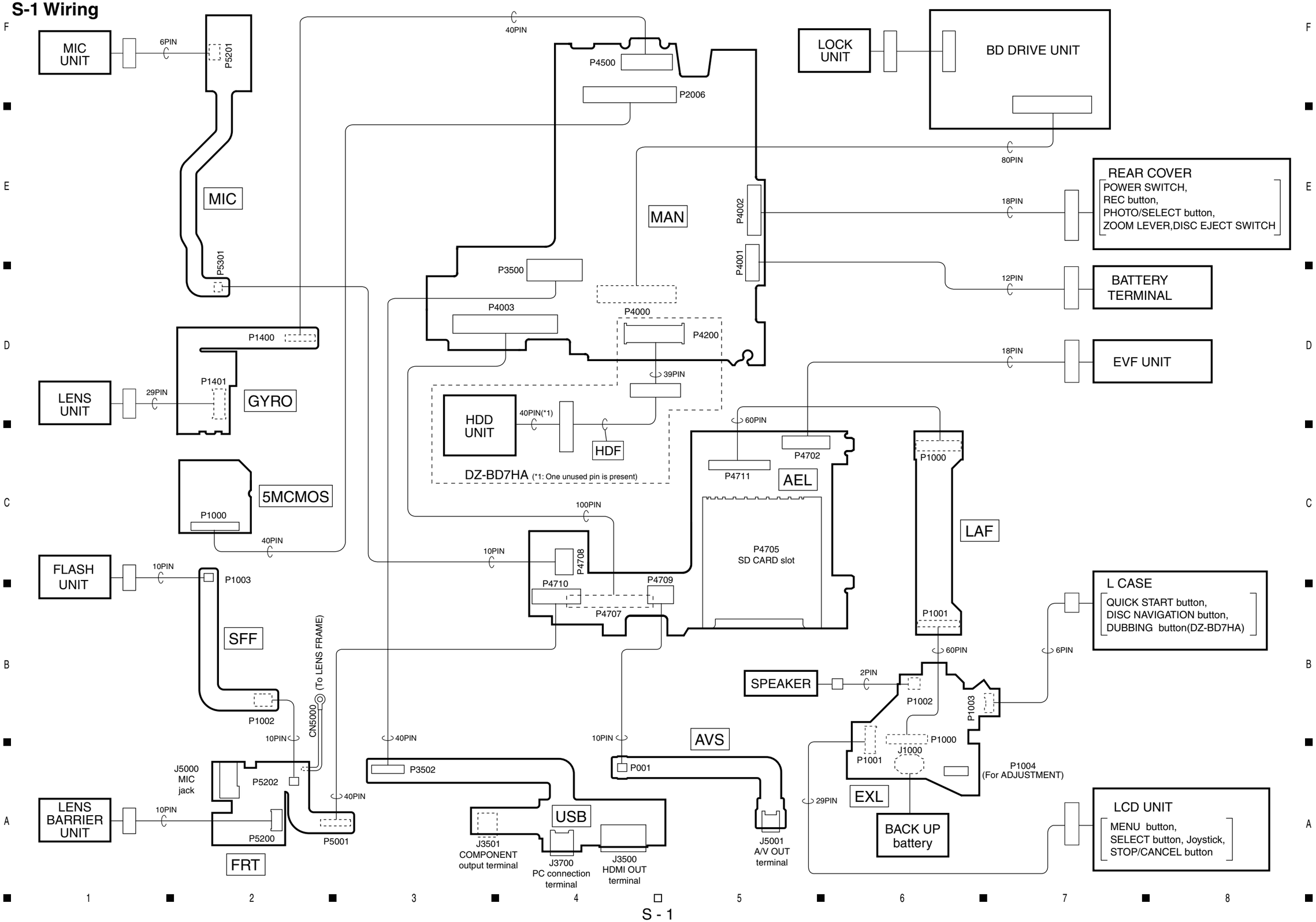


(*1) Even if the shapes of parts (#180 and #310) are different, the following disassembly procedure, using the DZ-BD7HA, is the same for all models.

(*2) #200 comprises the 5MCMOS circuit board assembly on which the sensor is mounted.

S Wiring and Schematic Diagrams

S-1 Wiring



S-2 5MCMOS

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001
Address → (3A)

PG1001
AUDIO-L	1
AUDIO-R	2

P1000

GND	40
AD2[11]	39
AD2[10]	38
AD2[9]	37
AD2[8]	36
AD2[7]	35
AD2[6]	34
AD2[5]	33
AD2[4]	32
AD2[3]	31
AD2[2]	30
AD2[1]	29
AD2[0]	28
GND	27
AD1[0]	26
AD1[1]	25
AD1[2]	24
AD1[3]	23
AD1[4]	22
AD1[5]	21
AD1[6]	20
AD1[7]	19
AD1[8]	18
AD1[9]	17
AD1[10]	16
AD1[11]	15
GND	14
89.01or74.25M	13
CLOCKOUT	12
C1.8V	11
C3V_CAM	10
C3V_CAM	9
HSYNC	8
VSYNC	7
C3V_LENVM_GND	6
SDI	5
SCK	4
CS_CMOS	3
GND	2
CMOS_RESET	1

To HD-DSP [MAN] P2006

R1000 0

R1002 0

R1005 0

I1000 5MCMOS

I1001 TK11125CSC 2.5V REG

L1000 BLM21PG221SN1D

L1001 BLM21PG221SN1D

C1008 100/6

C1007 100/6

C1009 0.01/16

C1003 0.01/16

C1006 1/6.3

C1005 1/6.3

C1004 1/6.3

C1002 0.01/16

C1019 470p

C1010 0.01/16

C1011 22/6.3

C1012 22/6.3

C1001 1.0/6.3

C1000 0.01/16

SDI
SCK
CS_CMOS

5MCMOS

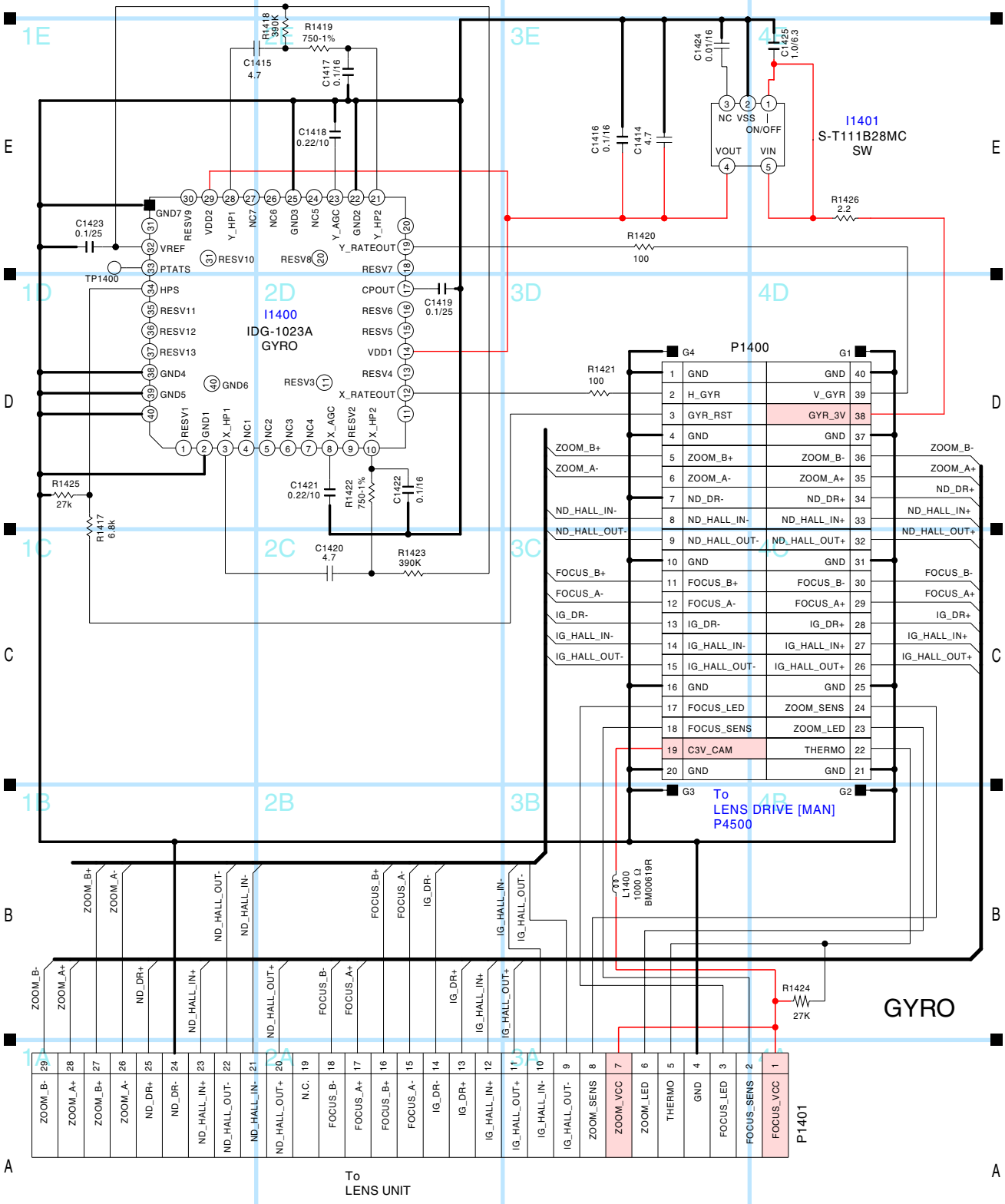
S-3 GYRO

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001	
AUDIO-L	1
AUDIO-R	2



S-4 HD-DSP [MAN]

To I/O (8F)
To CODEC (5F)
To CAMERA µP (5F)

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram → To MAIN (3A) → VIDEO
Address

Name of citcuit diagram and plug → To MAIN PG2001 (3A)
Address

PG1001
AUDIO-L 1
AUDIO-R 2

Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination.
See "Parts Search System" to check for the values and whether they are mounted.

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

To REGULATOR (8D)
GND
C1.0V
C1.8V
C3V_SYS
C3V_CAM

VCC GND
I2000 HD-DSP

CPU_PLL
I2000 HD-DSP

TEST_PIN
I2000 HD-DSP

VIDEO_IF
I2000 HD-DSP

Digital_IF
I2000 HD-DSP

To CODEC (6A)

To PLUG (1A)

To CAMERA µP (5F)

To LENS DRIVE (8B)

To CAMERA µP (5F)

To CODEC (5A)

To 5MCMOS P1000

To CAMERA µP (1E)

ARM_peri
I2000 HD-DSP

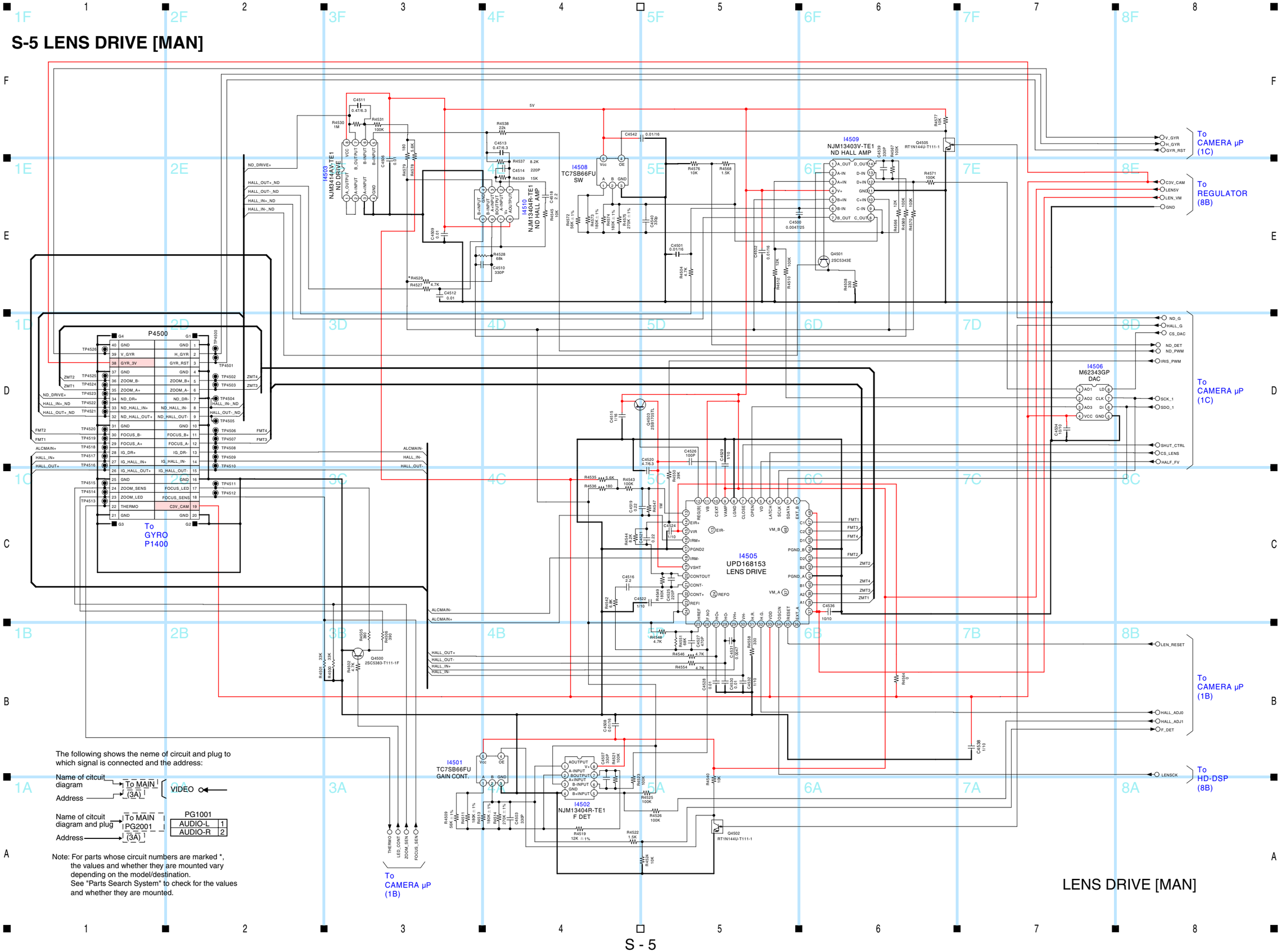
AD_IF,TG
I2000 HD-DSP

ARM_IF
I2000 HD-DSP

I2000 HD-DSP
SDRAM_IF

HD-DSP [MAN]

S-5 LENS DRIVE [MAN]



S-6 CAMERA µP [MAN]

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram → To MAIN (3A) → VIDEO

Address

To REGULATOR (8C)
To PLUG (1A)
To I/O (1B)
To HD-DSP (5F)
To HD-DSP (8B)
To HD-DSP (8C)
To PLUG (2A)

To HD-DSP (1A): SDO_2, SCK_2, CS_CMOS, CMOS_RESET

To LENS DRIVE (8F): H_GYR, V_GYR, GYR_RST, ND_G, HALL_G, CS_DAC, ND_DET, ND_PWM, IRIS_PWM, SHUT_CTRL, HALF_FV, CS_LENS, SCK_1, SDO_1

To LENS DRIVE (8D): LEN_RESET

To LENS DRIVE (8B): HALL_ADJ0, HALL_ADJ1, F_DET

To LENS DRIVE (3A): ZOOM_SEN, FOCUS_SEN, THERMO, LED_CONT

To PLUG (6F): T/W

I2301
CAMERA CONTROL

I2303
M95320-WDW6TP
EEPROM

I2302
TC74VHC244FK
BUF

To CODEC (5F): 13.5MHz
To CODEC (8E): CS_EEP_ORI
To CODEC (5A): SCI_RDY
To CODEC (6D): SCI_REQ
To CODEC (8E): H8_RESET
To CODEC (6D): EEP_SCK_ORI, EEP_SDI_ORI, EEP_SDO_ORI

CAMERA µP [MAN]

S-7 CODEC [MAN]

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of circuit diagram → To MAIN (3A) → VIDEO

Address

Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination.
See "Parts Search System" to check for the values and whether they are mounted.

To HD-DSP (5F)
To I/O (8B)
To CAMERA µP (8E)

I2502
SN74LVC74APW
CLOCK GEN

I2501
PLL

VCC GND
I2500
CODEC

SCI,I2C,AD,JTAG,IRQ,RESET

ATA I/F
TS I/F,GPIO_A
ARM,GPIO_B
DDR SDRAM I/F

To REGULATOR (8F)
To MEMORY (7F)
To HDD (2A)
To PLUG (6A)
To PLUG(3A)
To CAMERA µP(8C)
To I/O(8D)
To PLUG(4A)
To I/O(8E)
To CAMERA µP(8B)
To HDD(1B)
To REGULATOR(8A)
To PLUG(5A)
To I/O(1C)
To HDD(1A)
To HDMI(1A)
To PLUG(3A)
To I/O(8D)
To CAMERA µP (8A)
To PLUG(2A)
To I/O(8F)
To MEMORY (1C)
To MEMORY (4C)
To USB IC (4B)

AUDIO VIDEO I/F,GPIO_C

To HDMI (1E)
To PLUG (6A)
To CAMERA µP (8B)
To HD-DSP (8A)
To HDMI (1A)
To PLUG (1F)
To PLUG (3A)
To HDMI (1F)
To HDMI (1B)
To HD-DSP (8D)
To MEMORY (4E)
To MEMORY (7D)

CODEC [MAN]

S-8 MEMORY [MAN]

I3001
DDR SDRAM

I3002
DDR SDRAM

I3003
SDRAM

I3000
FLASH MEMORY

To CODEC (8B)

To CODEC (1D)

To CODEC(8D)

To I/O (8D)

To I/O (8F)

To I/O (8C)

To REGULATOR (8E)

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of circuit diagram

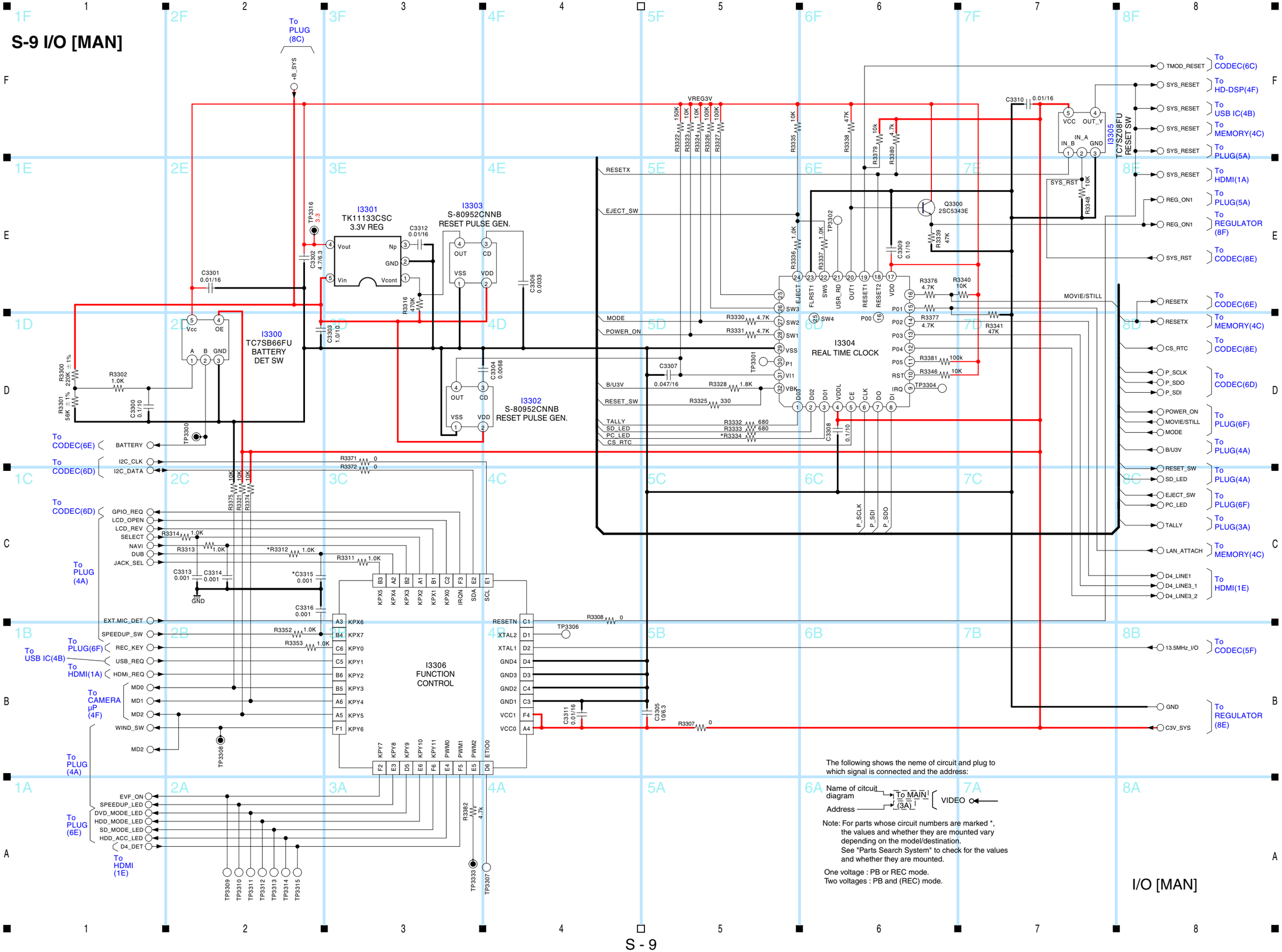
Address

To MAIN (3A)

VIDEO

MEMORY [MAN]

S-9 I/O [MAN]



The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram — To MAIN (3A) — VIDEO

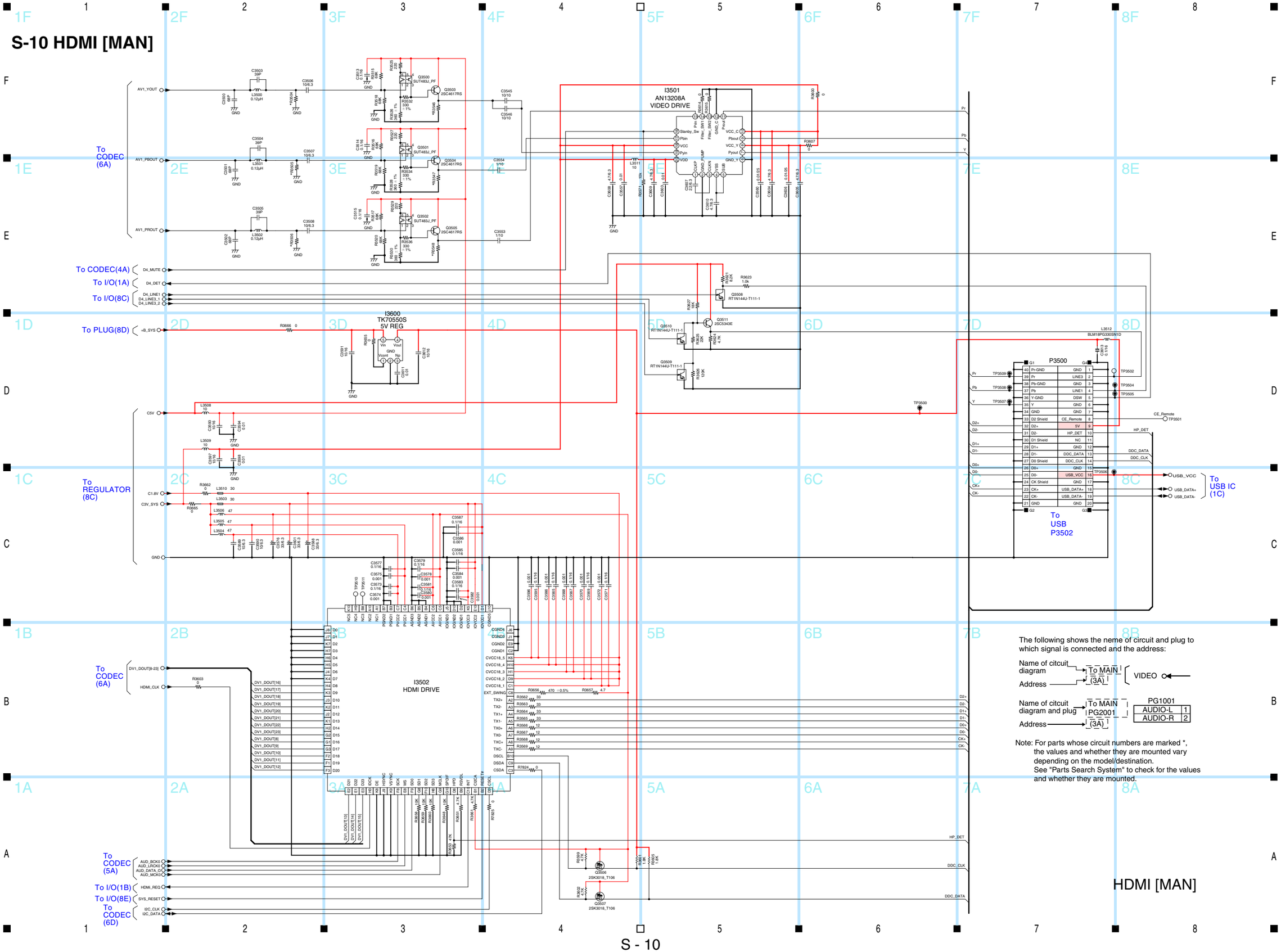
Address

Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination. See "Parts Search System" to check for the values and whether they are mounted.

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

I/O [MAN]

S-10 HDMI [MAN]



The following shows the neme of circuit and plug to which signal is connected and the address:

Name of circuit diagram → To MAIN (3A) → VIDEO

Address

Name of circuit diagram and plug → To MAIN PG2001 (3A) → PG1001 (AUDIO-L 1, AUDIO-R 2)

Address

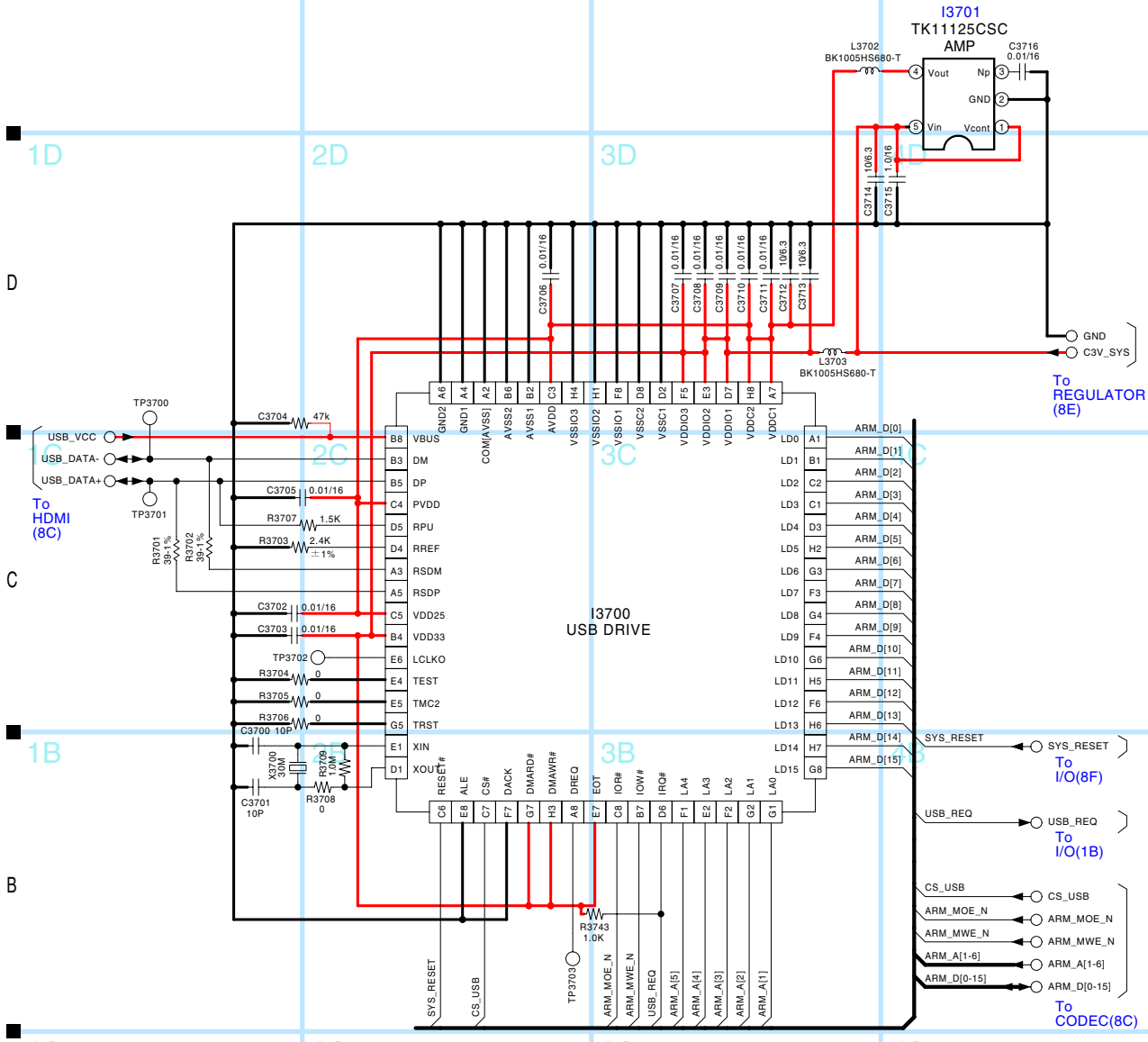
Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination. See "Parts Search System" to check for the values and whether they are mounted.

S-11 USB IC [MAN]

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram → To MAIN (3A) → VIDEO

Address



USB IC [MAN]

S-12 HDD [MAN]

The following shows the neme of circuit and plug to which signal is connected and the address:

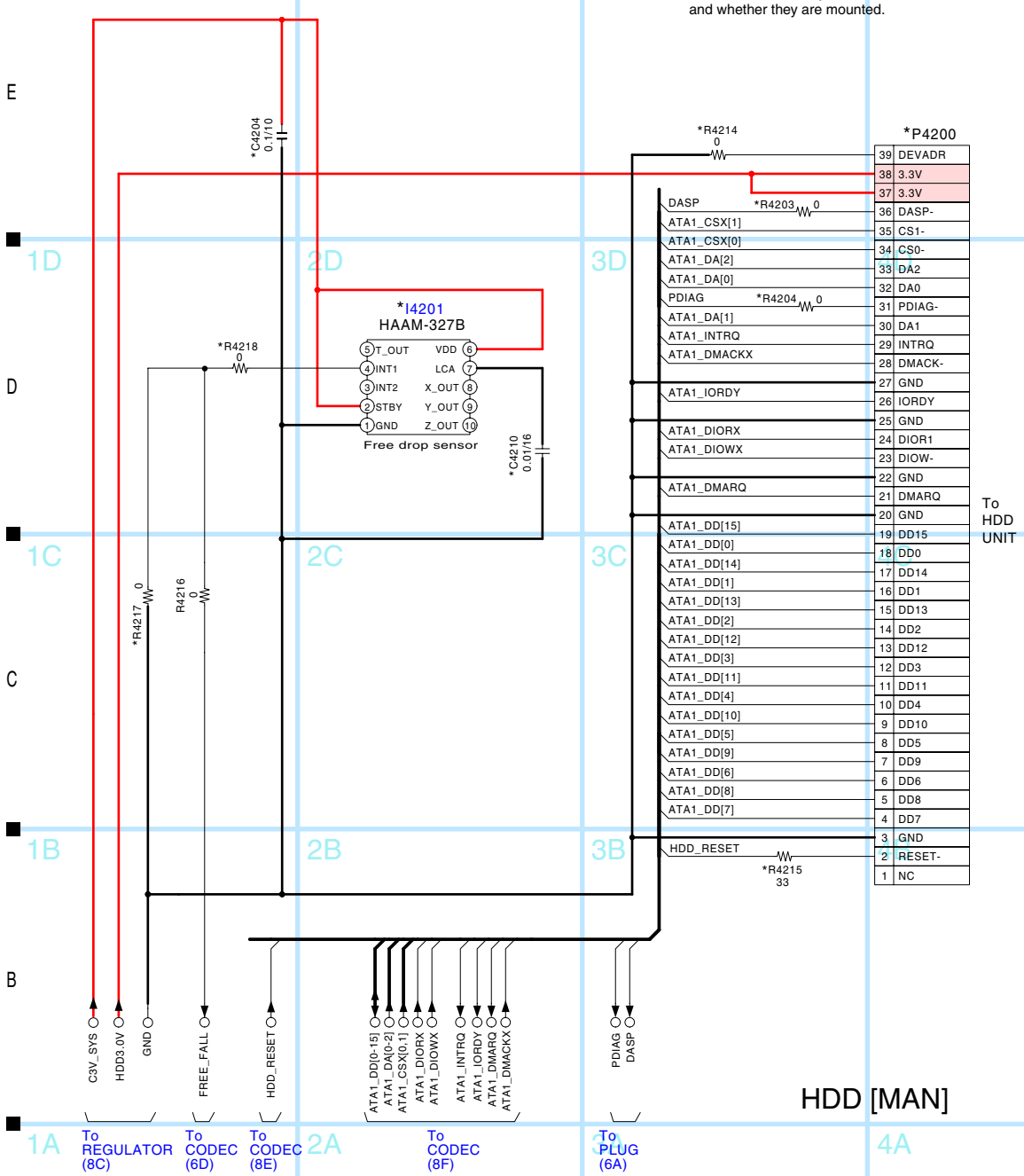
Name of citcuit diagram → To MAIN
Address → (3A)
VIDEO

Name of citcuit diagram and plug → To MAIN PG2001
Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination.
See "Parts Search System" to check for the values and whether they are mounted.



HDD [MAN]

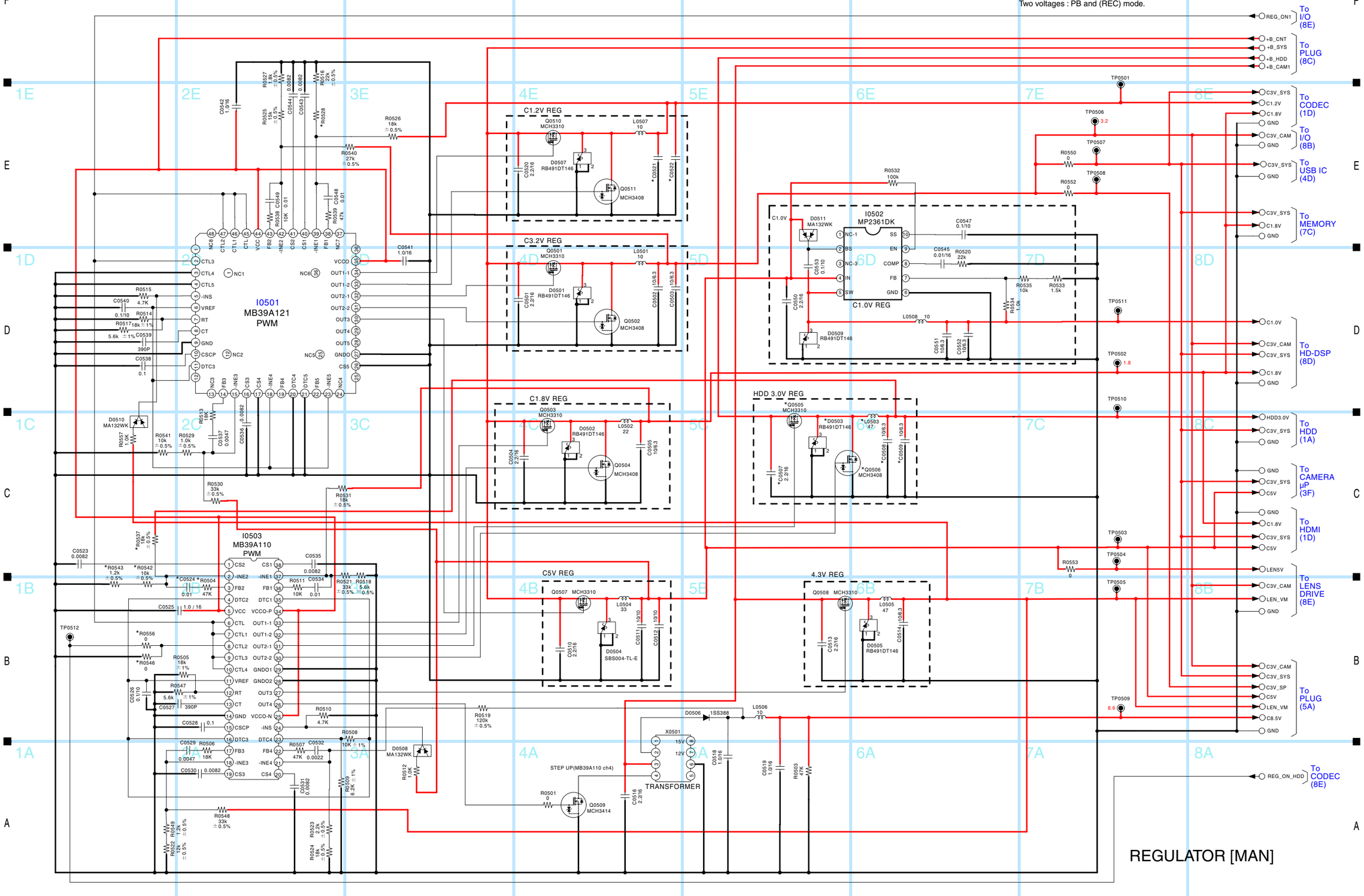
S-13 REGULATOR [MAN]

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of circuit diagram — To MAIN (3A) — VIDEO

Address

Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination.
See "Parts Search System" to check for the values and whether they are mounted.
One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.



REGULATOR [MAN]

S-14 PLUG [MAN]

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of circuit diagram
Address
To MAIN (3A) — VIDEO

Name of circuit diagram and plug
Address
To MAIN PG2001 (3A)

PG1001
AUDIO-L	1
AUDIO-R	2

Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination.
See "Parts Search System" to check for the values and whether they are mounted.

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

P4002
C3V(T/W)	1	SHUTTER
SUTTER	2	T/W
T/W	3	FOCUS_LOCK
FOCUS/LOCK	4	
GND	5	
MOVIE/STILL	6	MOVIE/STILL
HDD_LED	7	POWER_ON
DVD_LED	8	MODE
SD_LED	9	
PC_LED	10	PC_LED
C3V(LED)	11	EJECT_SW
ACCSESS_LED	12	
GND(LED)	13	
GND	14	
REC_KEY	15	REC_KEY
POWER	16	
MODE	17	
EJECT	18	

P4003
100	GND	GND	1	
99	H8_RESET	R_OUT	2	R_OUT
98	C3V_CAM	GND	3	
97	C3V_CAM	G_OUT	4	G_OUT
96	SYS_RESET	GND	5	
95	C5V	B_OUT	6	B_OUT
94	C5V	GND	7	
93	EVF_ON	GND	8	
92	MD2	SSG_HD	9	SSG_HD
91	SCK_PRG	SSG_FV	10	SSG_FV
90	GND	BAR_LED_CONT	11	BAR_LED_CONT
89	STPMT_WV2	GND	12	
88	STPMT_WV1	BAR_ENA	13	BAR_ENA
87	BAR_OPEN	BAR_CLOSE	14	BAR_CLOSE
86	SD	STB_PWM	15	STB_PWM
85	RD	STB_ON	16	STB_ON
84	STB_CHGSW	WB_IR	17	WB_IR
83	GND	GND	18	
82	STB_CHGRDY	AV2_MON_YOUT	19	
81	GND	GND	20	
80	RESET_SW	AV2_MON_COUT	21	
79	KEY1	GND	22	
78	KEY2	WIND_SW	23	WIND_SW
77	NC	LCE_OPEN	24	LCD_OPEN
76	TXDA	LCD_REV	25	LCD_REV
75	RXDA	SELECT	26	SELECT
74	C3V_SP	NAVI	27	NAVI
73	C3V_SYS	DUB	28	DUB
72	C3V_SYS	GND	29	
71	P_SCLK	P_SDO	30	P_SDO
70	AUD_DATA_I	CS_LCD	31	CS_LCD
69	AUD_DATA1_I	CS_AUD	32	CS_AUD
68	AUD_DATA_O	CS_EVF	33	CS_EVF
67	GND	GND	34	
66	AUD_MCK0	JACK_SEL	35	JACK_SEL
65	AUD_BCK0	EXT.MIC_DET	36	EXT.MIC_DET
64	AUD_LRCK0	SPEEDUP_SW	37	SPEEDUP_SW
63	B/U3V	TDI	38	TDI
62	SD_LED	TDO	39	TDO
61	LEN_VM	TMS	40	TMS
60	SPEEDUP_LED	GND	41	
59	GND	TCK	42	TCK
58	TALLY	TRST_N	43	TRST_N
57	REM_IN	C8.5V	44	
56	+B_HOTSHOE	+B_HOSTSHOE	45	
55	SDC_CDET	SDC_WP	46	SDC_WP
54	SDC_CMD	SDC_CLK	47	SDC_CLK
53	SDC_D[0]	SDC_D[1]	48	SDC_D[1]
52	SDC_D[2]	SDC_D[3]	49	SDC_D[3]
51	GND	GND	50	

P4000
80	GND	GND	1	
79	DD7	DD8	2	ATA1_DD[8]
78	DD6	DD9	3	ATA1_DD[9]
77	DD5	DD10	4	ATA1_DD[10]
76	DD4	DD11	5	ATA1_DD[11]
75	DD3	DD12	6	ATA1_DD[12]
74	DD2	DD13	7	ATA1_DD[13]
73	DD1	DD14	8	ATA1_DD[14]
72	DD0	DD15	9	ATA1_DD[15]
71	GND	GND	10	
70	DMARQ	HRST	11	ATA1_RESETX
69	DIOW	GND	12	
68	DIOR	GND	13	
67	IORDY	CSEL	14	
66	DMACK	GND	15	
65	INTRQ	IOCS16	16	PDIAG
64	DA1	PDIAG	17	ATA1_DA[2]
63	DA0	DA2	18	ATA1_CSX[1]
62	CS0	CS1	19	
61	DASP	HEATRUN	20	ACC_LED
60	SYSRST	ACC_LED	21	
59	GND	GND	22	REG_ON1
58	PON_FACT	REG_ON	23	
57	CV_OPEN	FMD47	24	
56	TCK	FMD_P	25	
55	TRST	FMD_N	26	
54	TDO	VC25	27	
53	RST	5VA	28	
52	TMS	3.3VD	29	
51	TD1	NC	30	
50	NC	NC	31	
49	+B(DRV)	NC	32	
48	+B(DRV)	GND	33	
47	+B(DRV)	GND	34	
46	+B(DRV)	GND	35	
45	+B(DRV)	GND	36	
44	+B(DRV)	GND	37	
43	+B(CNT)	GND	38	
42	NC	GND	39	
41	GND	GND	40	

P4001
1	+B
2	+B
3	+B
4	+B
5	+B
6	BATTERY TEMP
7	BATT/ADP
8	GND
9	GND
10	GND
11	GND
12	GND

To CODEC(6E)
To CAMERA µP(1A)
To CODEC(6E)
To I/O(8D)
To I/O (8C)
To I/O(1B)
To I/O (1A)
To REAR COVER
To AEL P4707
To BD DRIVE UNIT
To BATTERY TERMINAL
To HDMI (1D)
To REGULATOR (8F)
To I/O (2F)
To CODEC (6E)
To CAMERA µP (4F)
To HD-DSP (8C)
To CAMERA µP (6F)
To CODEC (6E)
To CODEC (6D)
To CODEC (6E)
To CODEC (6D)
To CODEC (8E)
To CODEC (5A)
To CODEC (6E)
To I/O (8D)
To I/O (8C)
To CODEC (8E)
To I/O (8C)
To I/O (1C)
To I/O (1B)
To REGULATOR (8B)
To I/O (8F)
To CODEC (8D)
To I/O (8E)
To CODEC (4A)
To CODEC (8F)
To HDD (3A)

PLUG [MAN]

S-15 USB

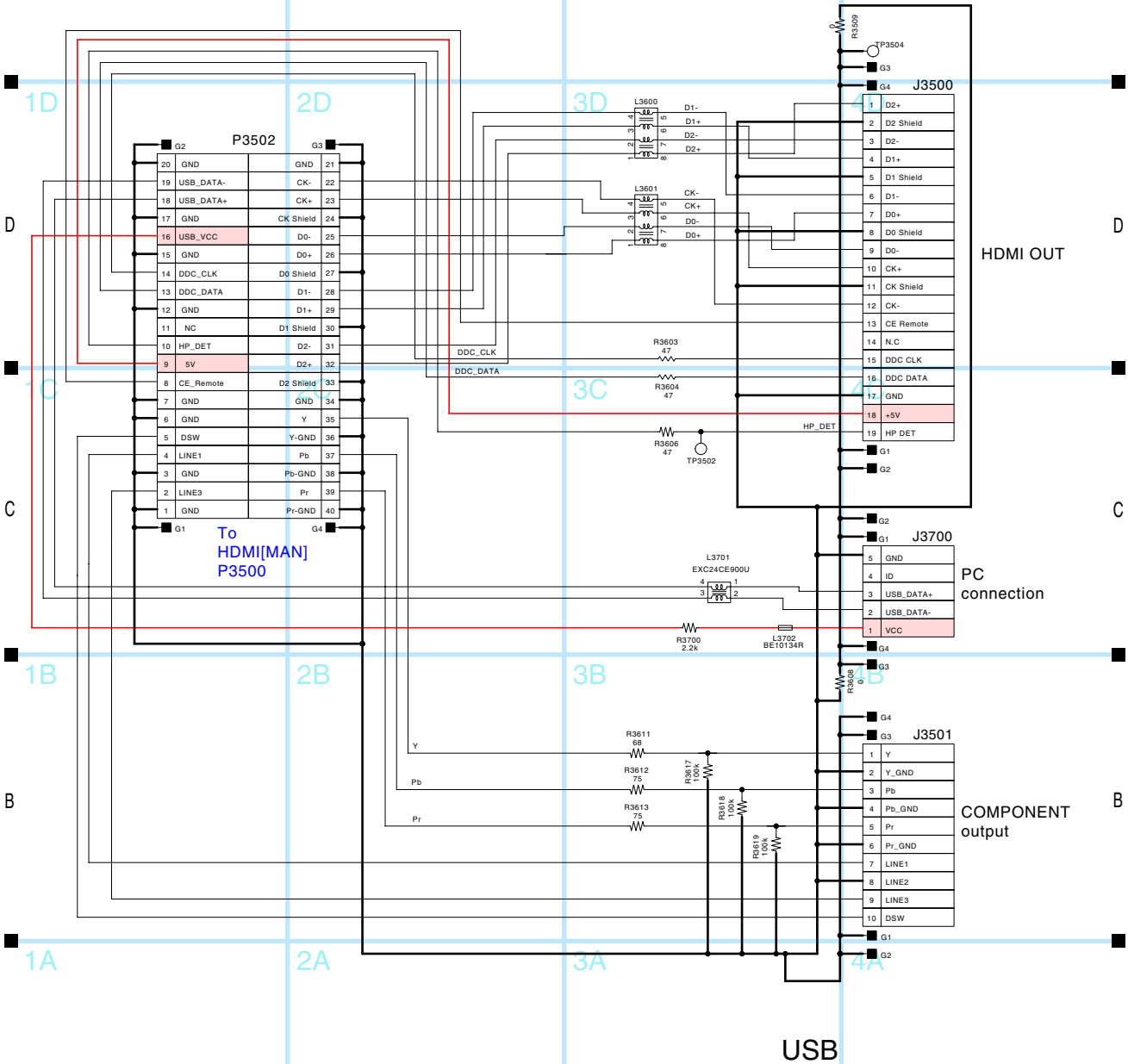
The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A) 1

PG1001

AUDIO-L	1
AUDIO-R	2



USB

S-16 AEL

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of circuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

P4702

To EVF UNIT

I4700 NJM2872AF25 2.5V REG

I4701 TK11131CSC 3.1V REG

SD CARD SLOT P4705

I4705 LB1935CL MOTOR DRIVE

P4707

To PLUG[MAN] P4003

P4711

To LAF P1000

To FRT P5001

P4710

P4708

To MIC P5301

P4709

To AVS P001

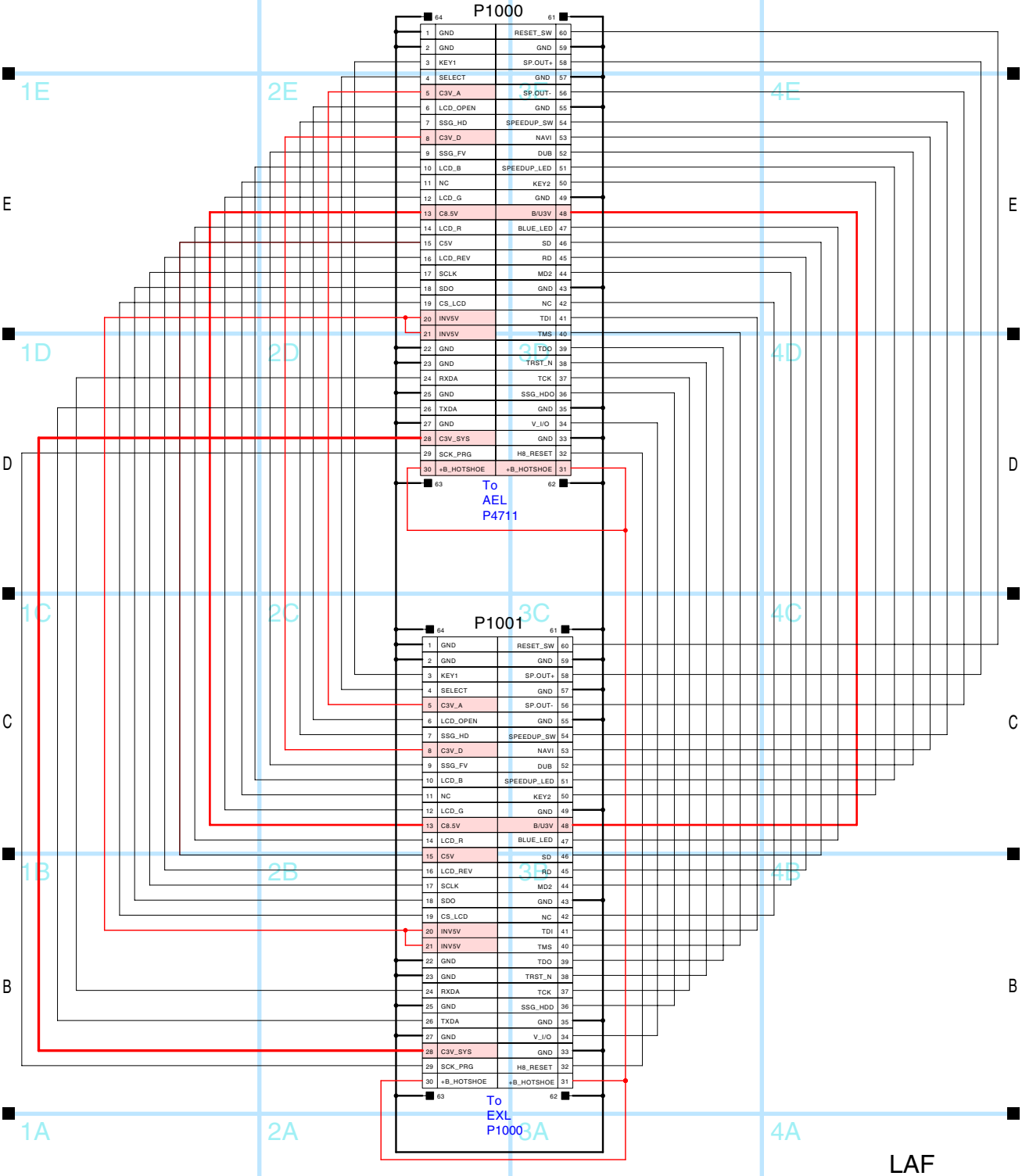
I4703 AK4568A AUDIO DAC & ADC/AV DRIVE

P4716

SD CARD

AEL

S-17 LAF



The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

S-18 EXL

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

One voltage : PB or REC mode.
Two voltages : PB and (REC) mode.

P1001

GND	29
GND	28
GND	27
INV5V	26
INV5V	25
CS_LCD	24
SDO	23
SCLK	22
LCD_REV	21
C5V	20
LCD_R	19
C8.5V	18
LCD_G	17
HDO	16
LCD_B	15
SSG_FV	14
C3V_D	13
SSG_HD	12
LCD_ROUT	11
LCD_OPEN	10
LCD_GOUT	9
C3V_A	8
LCD_BOUT	7
SYS3V_5	6
SELECT_4	5
KEY1_4	4
GND	3
GND	2
GND	1

To LCD UNIT

TP1027, TP1025, TP1024, TP1023, TP1022, TP1021, TP1020, TP1019, TP1018 8.6, TP1017, TP1016, TP1015, TP1014, TP1013, TP1012, TP1011, TP1010, TP1009, TP1008, TP1007, TP1006, TP1005, TP1004, TP1002

P1000

1	GND	RESET_SW	60
2	GND	GND	59
3	KEY1	SP.OUT+	58
4	SELECT	GND	57
5	C3V_A	SP.OUT-	56
6	LCD_OPEN	GND	55
7	SSG_HD	SPEEDUP_SW	54
8	C3V_D	NAVI	53
9	SSG_FV	DUB	52
10	LCD_B	SPEEDUP_LED	51
11	NC	KEY2	50
12	LCD_G	GND	49
13	C8.5V	B/U3V	48
14	LCD_R	BLUE_LED	47
15	C5V	SD	46
16	LCD_REV	RD	45
17	SCLK	MD2	44
18	SDO	GND	43
19	CS_LCD	NC	42
20	INV5V	TDI	41
21	INV5V	TMS	40
22	GND	TDO	39
23	GND	TRST_N	38
24	RXDA	TCK	37
25	GND	SSG_HDO	36
26	TXDA	GND	35
27	GND	V_I/O	34
28	C3V_SYS	GND	33
29	SCK_PRG	H8_RESET	32
30	+B_HOTSHOE	+B_HOTSHOE	31

64 … 61 … 63 … 62

To LAF P1001

RXDA, TXDA, SCK_PRG, V_I/O, H8_RESET

SD, RD, MD2, TDI, TMS, TDO, TRST_N, TCK, SSG_HDO

TP1105, TP1100

J1000

2	-
1	+

BATTERY TERMINAL

GND

S1000 SKRMAGE010 RESET

P1004

1	NC	NC	30
2	RXDA	SD	29
3	NC	RD	28
4	TXDA	MD2	27
5	GND	GND	26
6	SCK_PRG	SRST	25
7	C3V_SYS	TDI	24
8	V_I/O	TMS	23
9	GND	TDO	22
10	H8_RESET	TRST_N	21
11	LCD_HD0	TCK	20
12	LCD_BOUT	SSG_HD0	19
13	LCD_GOUT	C3V_CAM	18
14	LCD_ROUT	NC	17
15	+B_HOTSHOE	+B_HOTSHOE	16

For ADJUSTMENT

R1100 33, R1101 33, R1102 33, C1100 0.1, L1000 BM00618R, R1117 10, R1118 10, R1119 10

TP1101, TP1102, TP1103, TP1104, R1103 33, R1104 33

P1002

SP.OUT+	1
SP.OUT-	2

To SPEAKER

TP1000, TP1001

GND

Q1000 RT1P144U-T111-1, R1011 180, C1001 0.1/16

P1003

1	SPEEDUP_LED
2	NC
3	GND
4	SPEEDUP_SW
5	NAVI
6	DUB

To L CASE

R1110 20K, R1111 4.7K, R1112 4.3K, R1113 6.2K, R1114 10K, R1115 18K, R1116 43K

S1001 SKRMAGE010 FULL AUTO
S1002 SKRMAGE010 FOCUS
S1003 SKRMAGE010 EXPOSURE
S1004 SKRMAGE010 BLC
S1005 SKRMAGE010 DISPLAY
S1006 SKRMAGE010 QUICK MENU
S1007 SKRMAGE010 FINALIZE

EXL

S-19 FRT

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

I5000
TK11125CSC
2.5V REG

R5022 0
C5013 0.01
Vout, Np, GND, Vin, Vcont

R5021 6.8k
R5020 6.8k
C5011 10/6.3
C5012 1.0/16

EXT.MIC_IN
EXT.MIC_L
EXT.MIC_R

J5000
EXTERNAL MICROPHONE

L5000 BK1005HM102-T
L5002 BK1005HM102-T
L5001 BK1005HM102-T

R5010 10k
R5006 150K
Q5003 2SA1980EF_AY
Q5000 2SC5343E
R5003 470
C5004 1.0/6.3
R5007 56k
R5011 1.0K
R5016 5.6k
R5017 150
C5009 22/4
C5000 0.01
C5002 0.0022

Q5004 2SC5343E
R5018 4.7K
C5010 10/6.3

EXT. MIC AMP

R5012 10k
R5008 150K
Q5002 2SA1980EF_AY
Q5001 2SC5343E
R5002 470
C5003 1.0/6.3
R5014 5.6k
R5009 56k
R5015 150
R5013 1.0K
C5007 22/4
C5001 0.0022

STB_FANA
STB_CHGSW

P5202

10	GND	STB_RDY	1
9	STB_FANA	STB_ON	2
8	STB_OSCI	C5V	3
7	STB_+B	STB_GND	4
6	STB_+B	STB_GND	5

12
11

To SFF P1002

C5223 0.33/10
C5224 10/10
C5225 10/10
L5201 1
TP5202

STB_RDY
STB_ON

REMOTE CONT. RECEIVER

I5201
RPMS2381-H19
Vcc, GND1, Rout, GND2

R5222 0
C5207 10/6.3
R5217 47
R5251 33k
C5226 0.1/16

I5202
TC7PA17FU
AMP
1Y, Vcc, 2Y, 1A, GND, 2A

WB IR RECEIVER
D5200 PD4 10P2E00F

R5225 2.2M
D5201 DAP222T1G
C5216 0.22/10
Q5204 2SD2345JSL
R5226 10M
Q5205 2SC5383-T111-1E
R5236 1.8K
R5231 330K
C5213 0.22/10
R5227 4.7K

D5202 TLRMV1022
TALLY LED

P5001

1	GND	GND	40
2	C5V	GND	39
3	REM_IN	NC	38
4	TALLY	WB_IR	37
5	GND	GND	36
6	GND	GND	35
7	BAR_OPEN	BAR_CLOSE	34
8	STPMTOUT1	STPMTOUT2	33
9	STPMTOUT3	STPMTOUT4	32
10	C3V_CAM	BAR_LED_CONT	31
11	GND	GND	30
12	STB_+B	C5V	29
13	STB_+B	GND	28
14	STB_+B	STB_CHGSW	27
15	STB_PWM	STB_CHGRDY	26
16	STB_ON	EXT.MIC_5V	25
17	EXT.A.GND	EXT.MIC_R	24
18	EXT.MIC_IN	EXT.A.GND	23
19	GND	EXT.MIC_L	22
20	GND	EXT.A_GND	21

G4, G1, G3, G2

To AEL P4710

P5200

	NC	10	
	A/	9	
	B/	8	
	A	7	
	B	6	
	C_CATHODE	5	
	C_EMITTER	4	
	VCC	3	
	O_CATHODE	2	
	O_EMITTER	1	

11
12

To LENS BARRIER UNIT

CN5000
To LENS FRAME

STPMTOUT2
STPMTOUT4
STPMTOUT1
STPMTOUT3
BAR_CLOSE
BAR_LED_CONT
BAR_OPEN
STB_FANA
STB_ON
EXT.MIC_IN

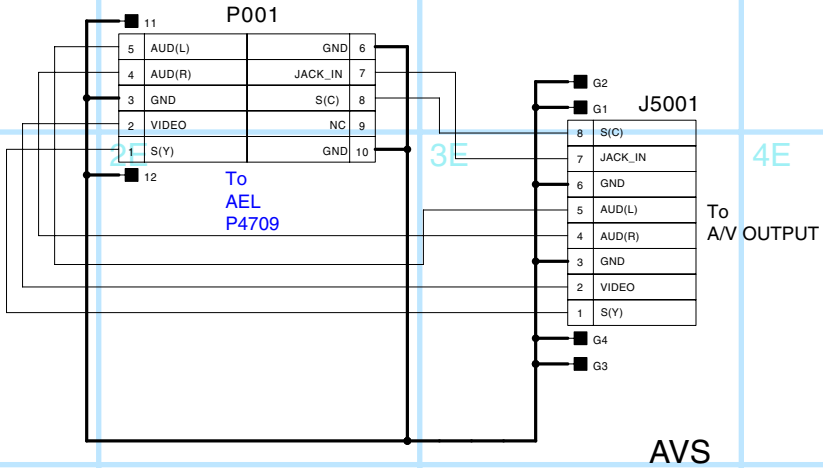
R5200 220
R5201 220
R5202 1.0K
R5203 270K
Q5201 2SC5383-T111-1F
R5250 47k
R5204 47K
Q5200 2SC5383-T111-1F
TP5200
TP5201

R5019 0

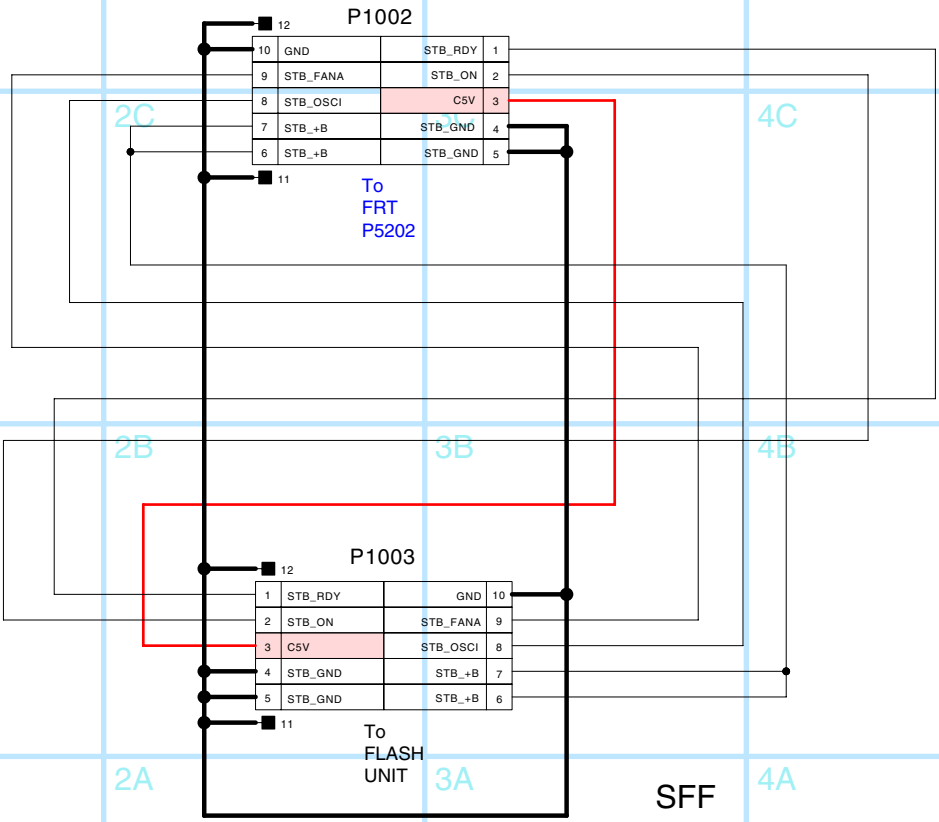
STB_CHGSW
STB_RDY
EXT.MIC_R
EXT.MIC_L

FRT

S-20 AVS



S-21 SFF



The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

S-22 MIC

The following shows the neme of circuit and plug to which signal is connected and the address:

Name of citcuit diagram and plug → To MAIN PG2001

Address → (3A)

PG1001

AUDIO-L	1
AUDIO-R	2

P5201

L-GND	1
MIC-(L)	2
M-GND	3
R-GND	4
MIC-(R)	5
R-GND	6

To MICROPHONE

I5200 NJM2112V(TE1)

MIC AMP

Q5202 2SC5343E

Q5203 2SC5343E

Q5206 RT1N241U-T111-1

Q5207 RT1N241U-T111-1

Q5208 2SC5343E

Q5209 2SC5343E

Q5210 2SC5343E

Q5211 2SC5343E

Q5212 2SC5343E

L5200 100µH

P5301

5	WIND_SW	INT.MIC_5V	6
4	INT.A.GND	INT.A.GND	7
3	INT.MIC_L	INT.MIC_R	8
2	INT.A.GND	INT.A.GND	9
1	INT.MIC_L1	INT.MIC_R1	10

To AEL P4708

P5302

INT.MIC_L

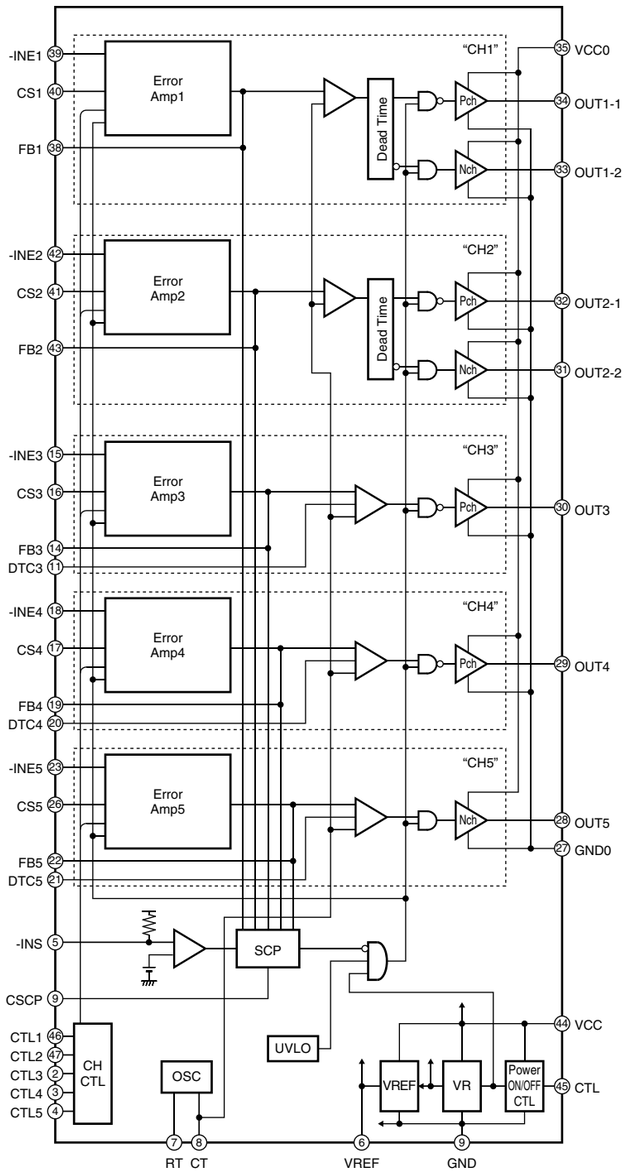
INT.MIC_R

WIND_SW

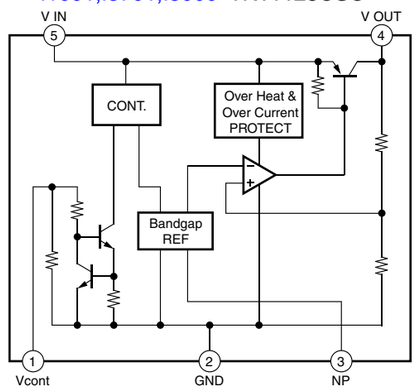
MIC

S-23 IC Block (1/2)

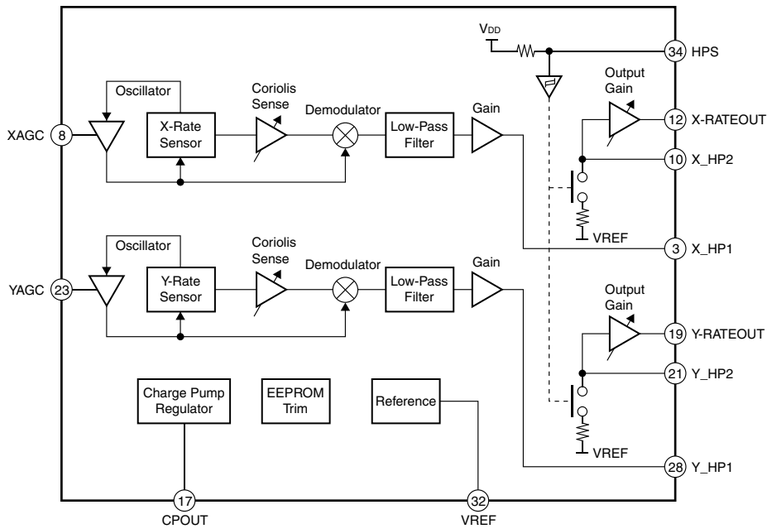
I0501
MB39A121



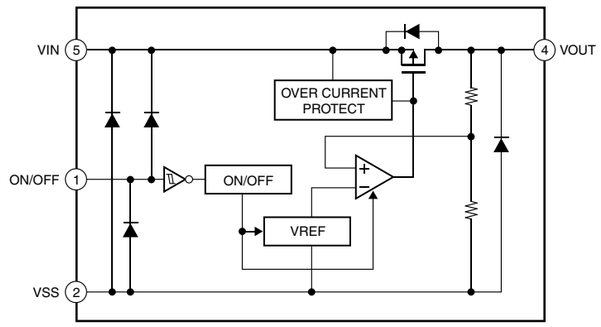
I3301 TK11133CSCL
I4701 TK11131CSCL
I1001,I3701,I5000 TK11125CSC



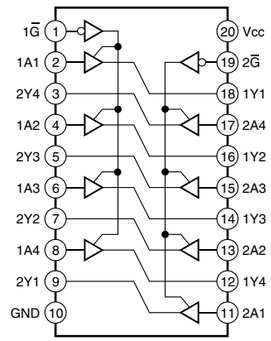
I1400
IDG-1023A



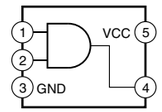
I1401
S-T111B28MC



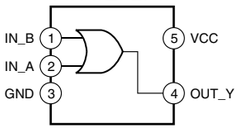
I2302
TC74VHC244FK



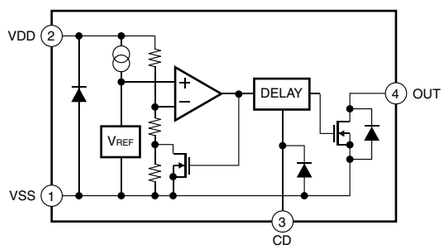
I3305
TC7SZ08FU



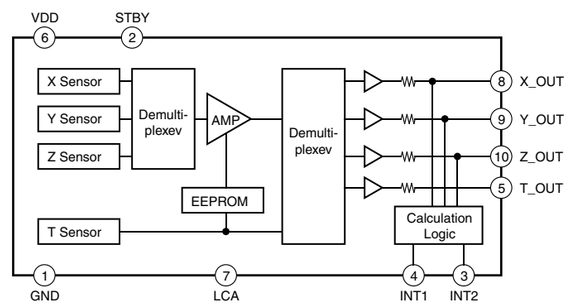
I4000
TC7SZ32FU



I3302,I3303
S-80952CNNB

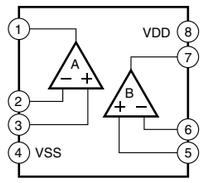


I4201
HAAM-327B

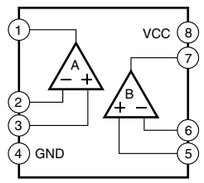


S-24 IC Block (2/2)

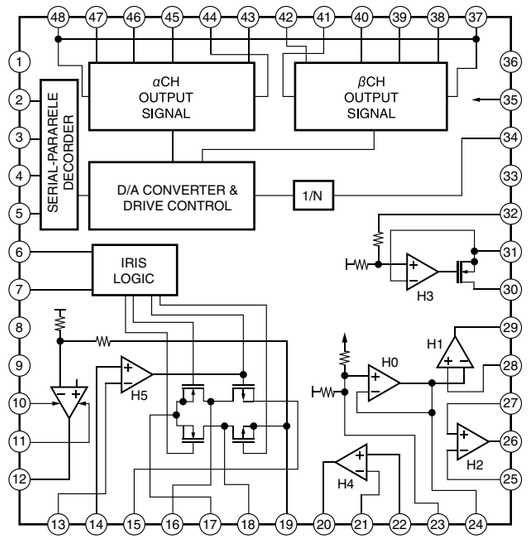
I4502,I4510
NJM13404R-TE1



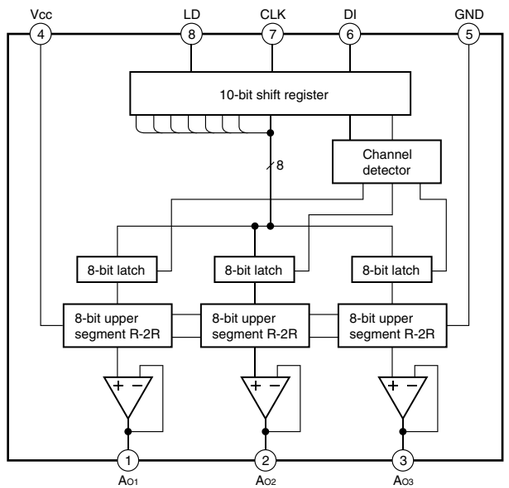
I4503
NJM3414AV-TE1



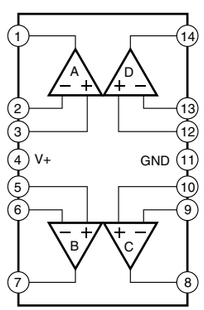
I4505
μPD168153



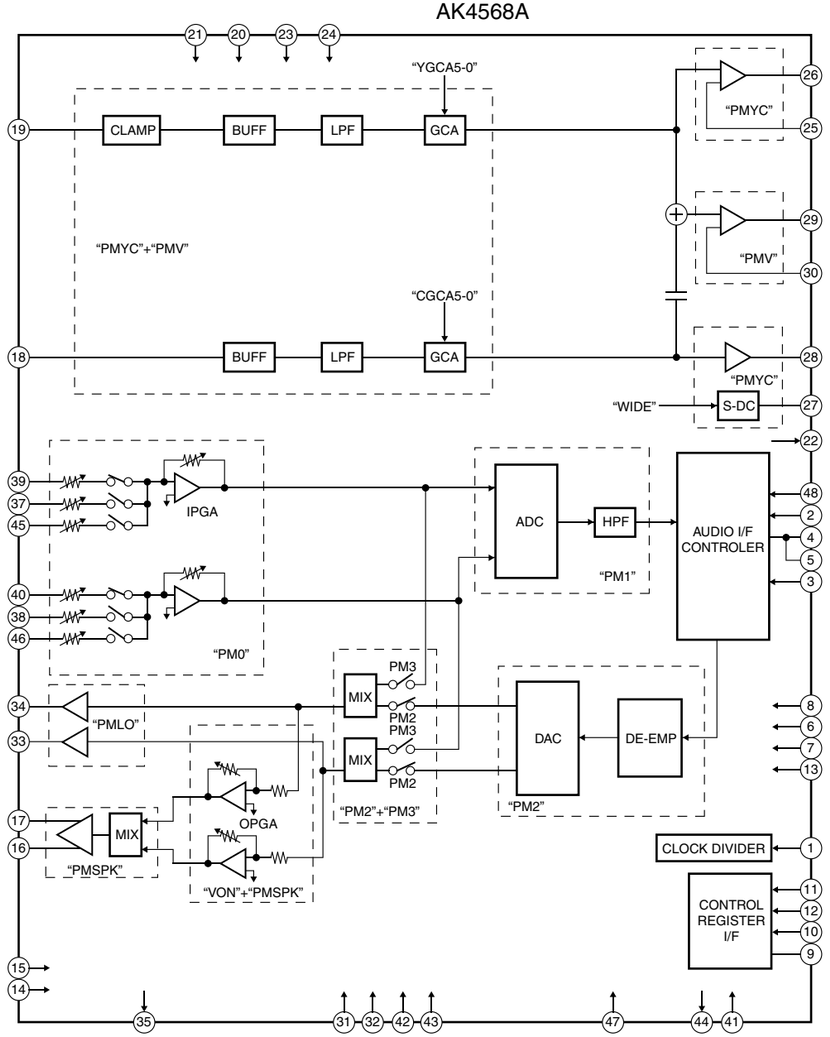
I4506
M62343GP



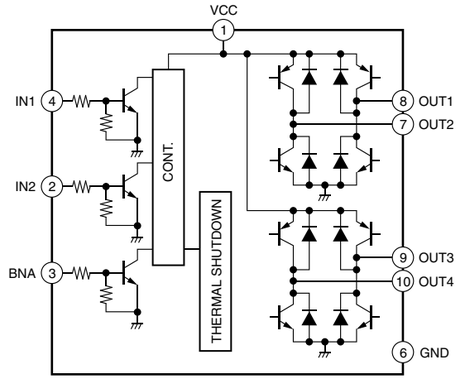
I4509
NJM13403V-TE1



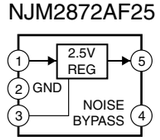
I4703
AK4568A



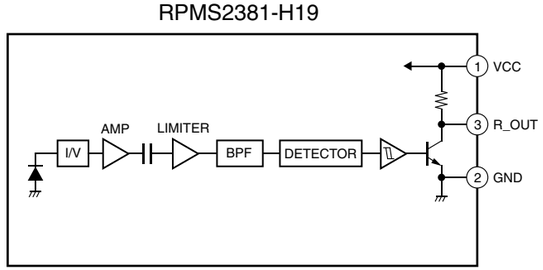
I4705
LB1935CL



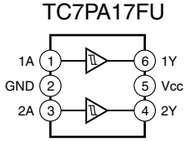
IC4700
NJM2872AF25



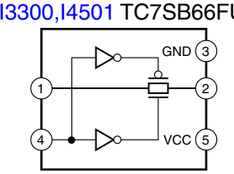
I5201
RPMS2381-H19



I5202
TC7PA17FU

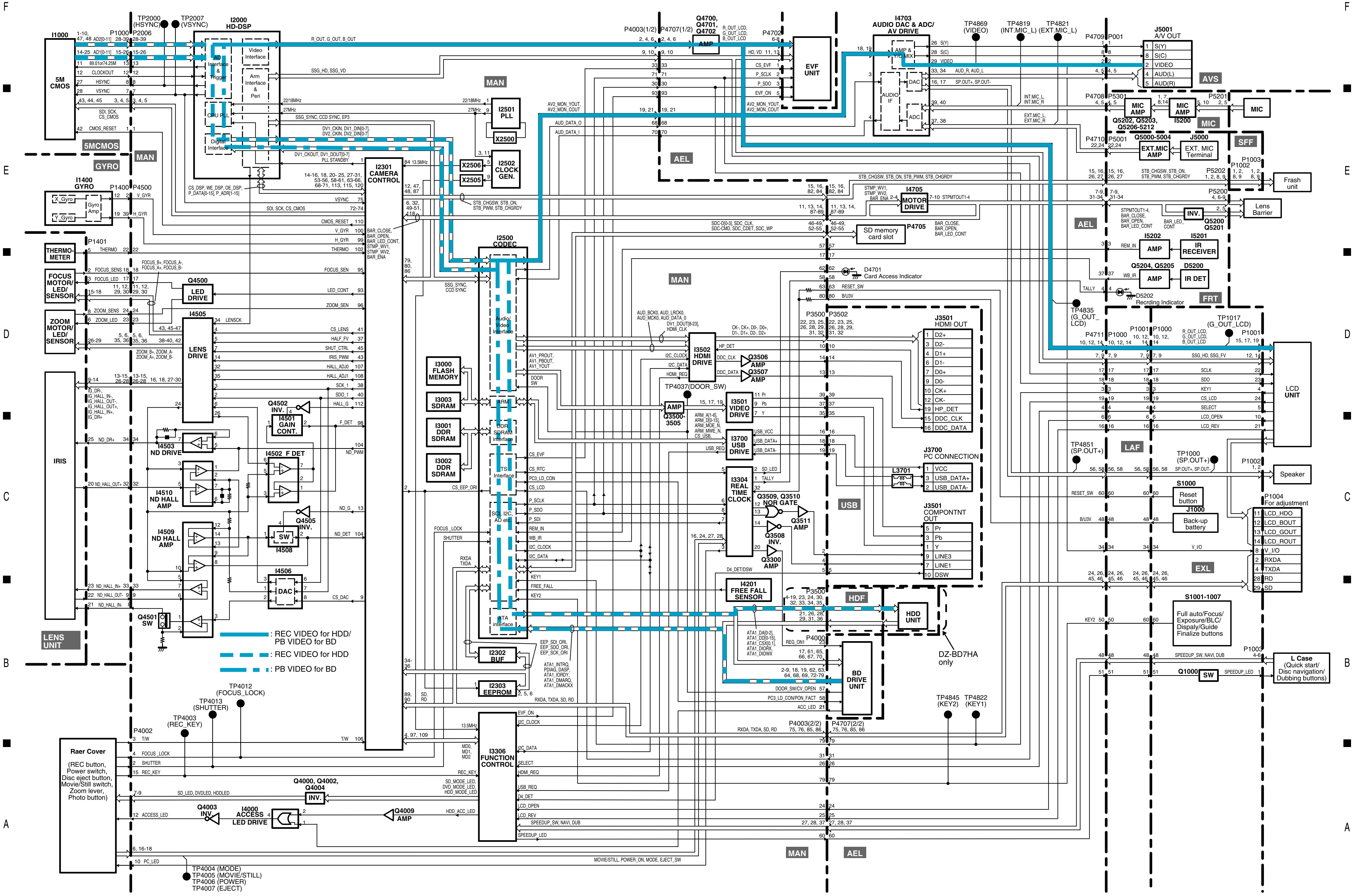


I4508 TC7SB66FC
I3300,I4501 TC7SB66FU



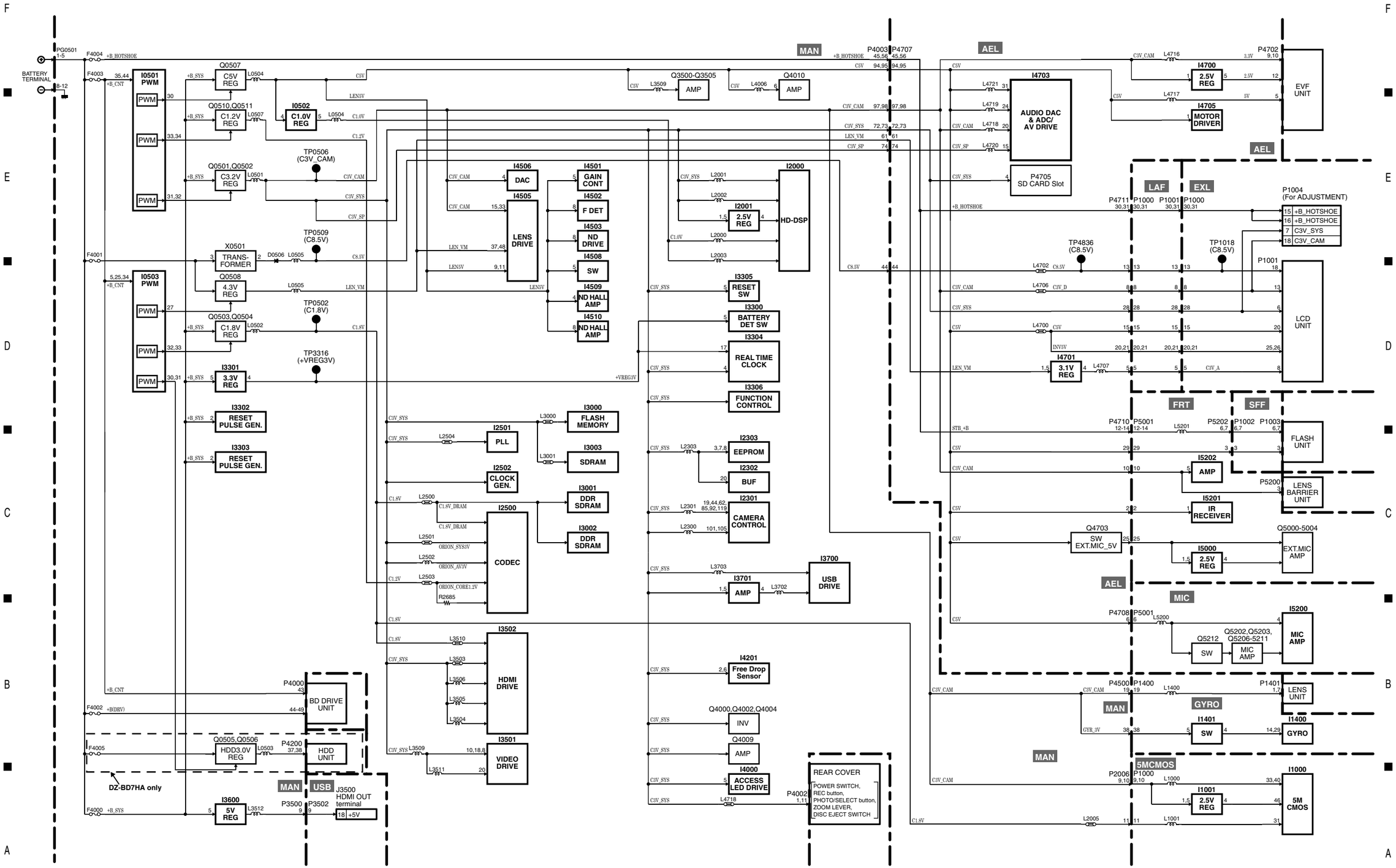
B Block Diagrams

B-1 Overall Block Diagram



I1000 5M CMOS
5MCMOS
I2000 HD-DSP
AD Interface & Trigger
Video Interface
Arm Interface & Peri
CPU PLL
Digital Interface
TP2000 (HSYNC)
TP2007 (VSYNC)
P1000
P2006
I1400 GYRO
X_Gyro
Y_Gyro
Gyro Amp
P1400
P4500
GYRO
MAN
P1401
THERMO-METER
FOCUS MOTOR/ LED/ SENSOR
ZOOM MOTOR/ LED/ SENSOR
Q4500 LED DRIVE
I4505 LENS DRIVE
IRIS
I4503 ND DRIVE
I4510 ND HALL AMP
I4509 ND HALL AMP
Q4501 SW
Q4502 INV.
I4501 GAIN CONT.
I4502 F DET
Q4505 INV.
SW I4508
I4506 DAC
LENS UNIT
: REC VIDEO for HDD/ PB VIDEO for BD
: REC VIDEO for HDD
: PB VIDEO for BD
I2301 CAMERA CONTROL
I2501 PLL
X2500
I2502 CLOCK GEN.
X2506
X2505
I2500 CODEC
Audio/ Video Interface
ARM
DDR SDRAM interface
TS Interface
SCI, I2C, AD etc.
ATA interface
I3000 FLASH MEMORY
I3003 SDRAM
I3001 DDR SDRAM
I3002 DDR SDRAM
I2302 BUF
I2303 EEPROM
I3306 FUNCTION CONTROL
Raer Cover
(REC button, Power switch, Disc eject button, Movie/Still switch, Zoom lever, Photo button)
P4002
TP4012 (FOCUS_LOCK)
TP4013 (SHUTTER)
TP4003 (REC_KEY)
TP4004 (MODE)
TP4005 (MOVIE/STILL)
TP4006 (POWER)
TP4007 (EJECT)
Q4000, Q4002, Q4004 INV.
Q4003 INV.
I4000 ACCESS LED DRIVE
Q4009 AMP
P4003(1/2)
P4707(1/2)
Q4700, Q4701, Q4702 AMP
P4702
EVF UNIT
AEL
I4703 AUDIO DAC & ADC/ AV DRIVE
AMP & Y/C MIX
AUDIO IF
DAC
ADC
TP4869 (VIDEO)
TP4819 (INT.MIC_L)
TP4821 (EXT.MIC_L)
P4709
P001
J5001 A/V OUT
AVS
P4708
P5301
MIC AMP
Q5202, Q5203, Q5206-5212
MIC AMP I5200
P5201
MIC
P4710
P5001
Q5000-5004 EXT.MIC AMP
J5000 EXT. MIC Terminal
SFF
P1003
P1002
P5202
Frash unit
I4705 MOTOR DRIVE
P5200
INV.
Q5200 Q5201
Lens Barrier
SD memory card slot
P4705
I5202 AMP
I5201 IR RECEIVER
Q5204, Q5205 AMP
D5200 IR DET
D4701 Card Access Indicator
D5202 Recrding Indicator
FRT
TP4835 (G_OUT_LCD)
TP1017 (G_OUT_LCD)
P4711
P1000
P1001
LCD UNIT
I3502 HDMI DRIVE
Q3506 AMP
Q3507 AMP
TP4037(DOOR_SW)
Q3500-3505 AMP
I3501 VIDEO DRIVE
I3700 USB DRIVE
I3304 REAL TIME CLOCK
Q3509, Q3510 NOR GATE
Q3511 AMP
Q3508 INV.
Q3300 AMP
I4201 FREE FALL SENSOR
P3500
P3502
J3501 HDMI OUT
J3700 PC CONNECTION
L3701
J3501 COMPONTNT OUT
USB
HDF
HDD UNIT
DZ-BD7HA only
P4000
BD DRIVE UNIT
P4003(2/2)
P4707(2/2)
TP4845 (KEY2)
TP4822 (KEY1)
TP4851 (SP.OUT+)
LAF
TP1000 (SP.OUT+)
Speaker
S1000 Reset button
J1000 Back-up battery
P1004 For adjustment
EXL
S1001-1007
Full auto/Focus/ Exposure/BLC/ Dispaly/Guide Finalize buttons
L Case (Quick start/ Disc navigation/ Dubbing buttons)
Q1000 SW

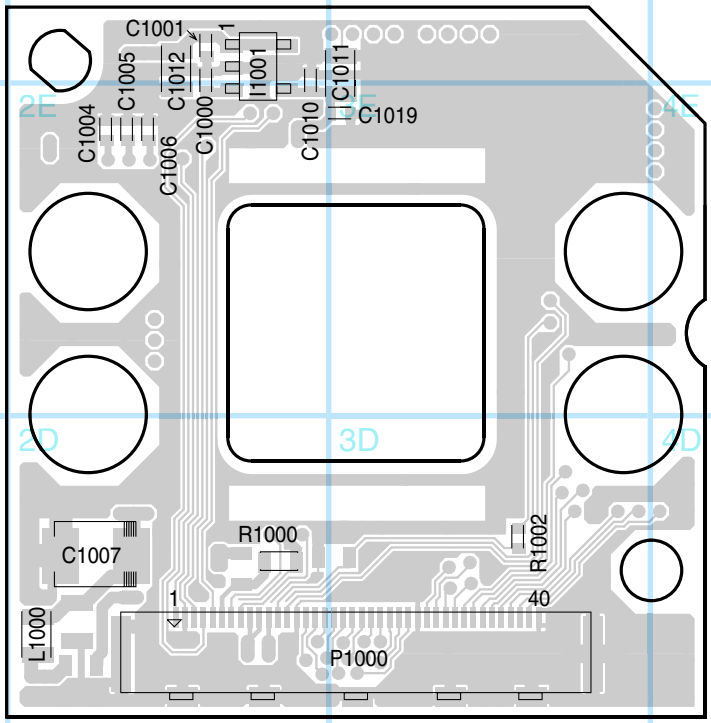
B-2 Regulator Block Diagram



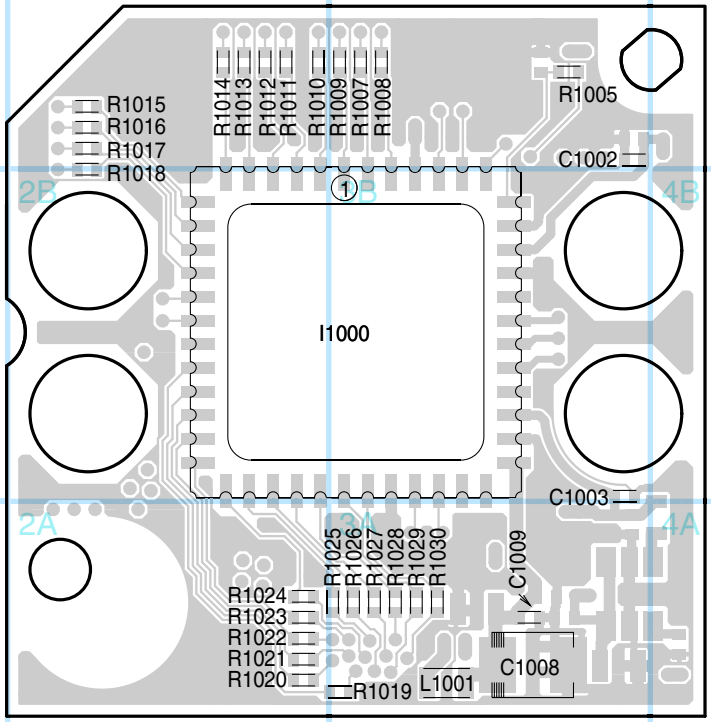
C Circuit Board Diagrams

C-1 5MCMOS [Pattern No.JA0923-4]

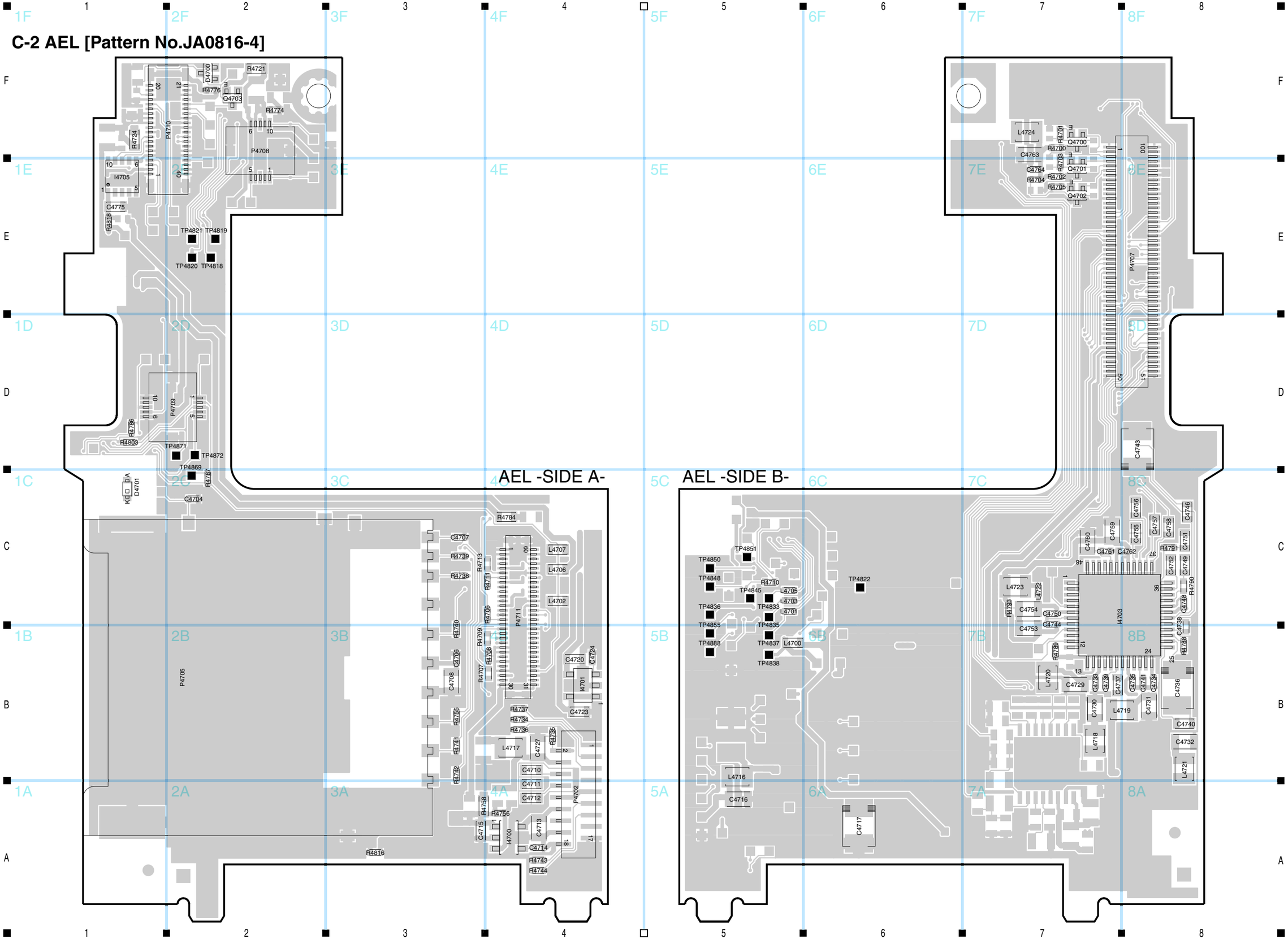
5MCMOS -SIDE A-



5MCMOS -SIDE B-

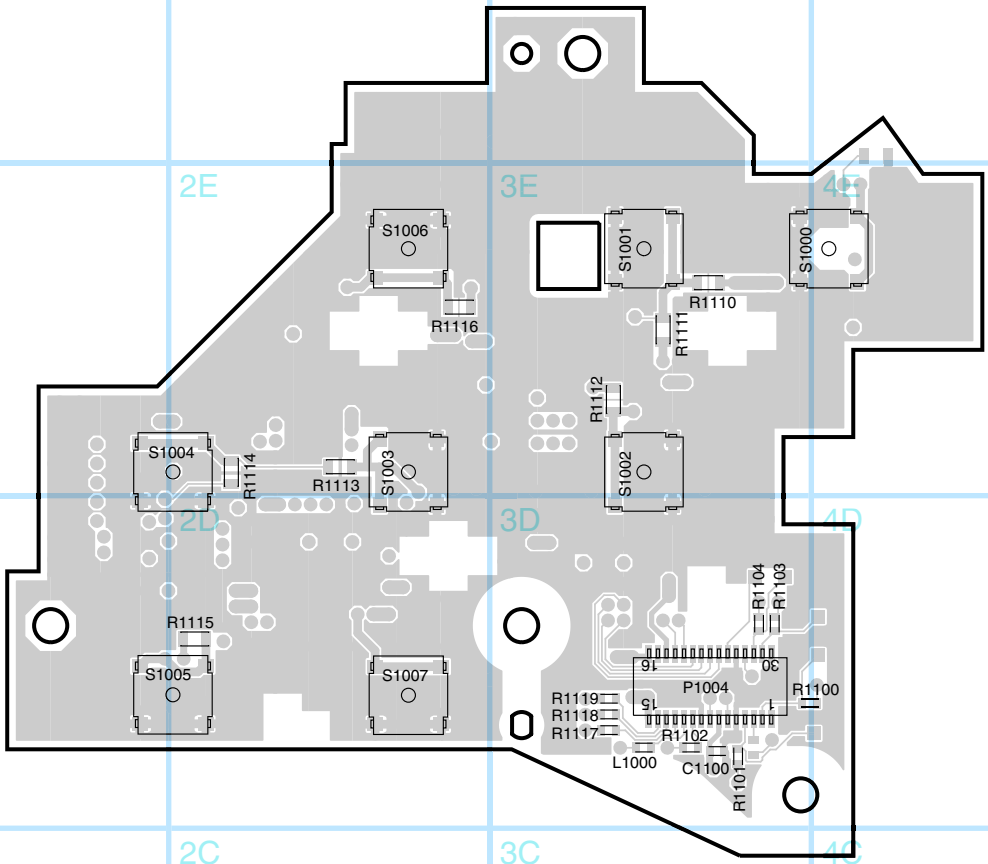


C-2 AEL [Pattern No.JA0816-4]

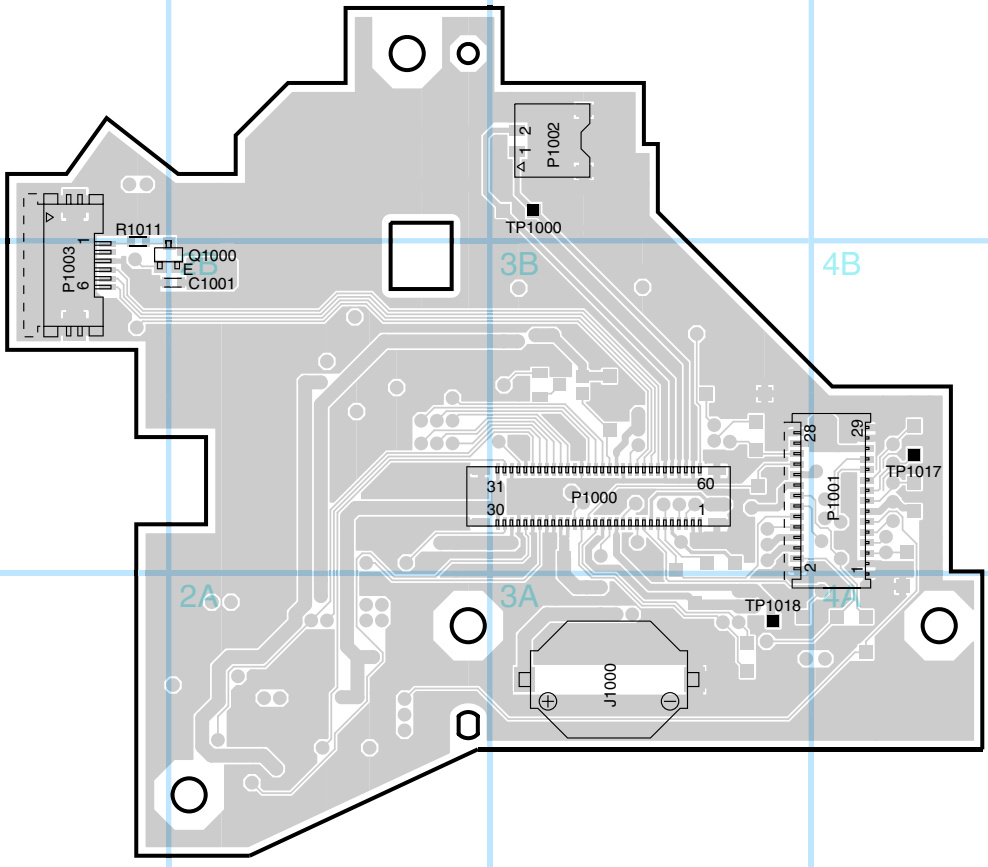


C-3 EXL [Pattern No.JA0956-5]

EXL -SIDE A-

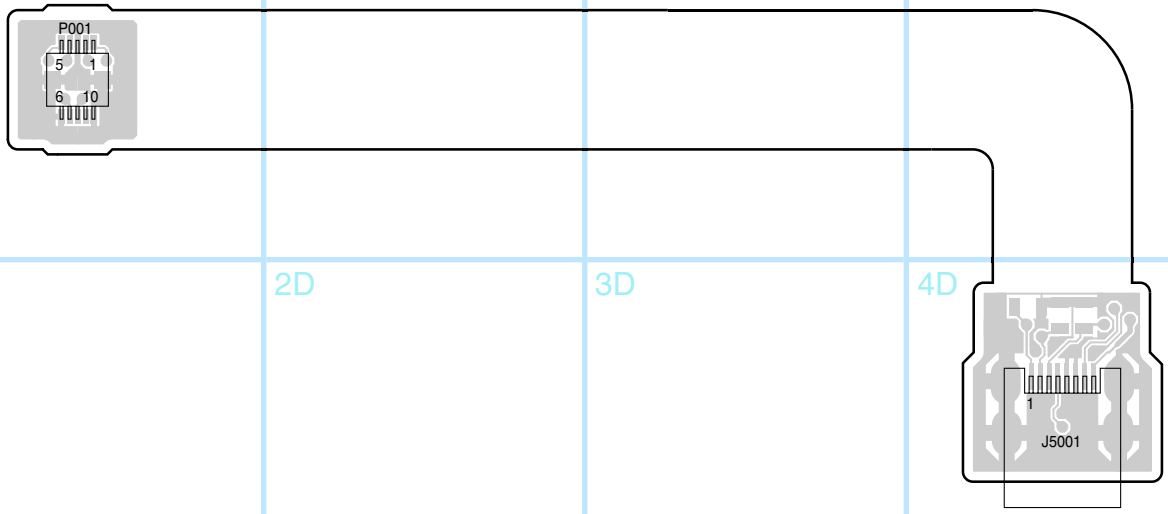


EXL -SIDE B-

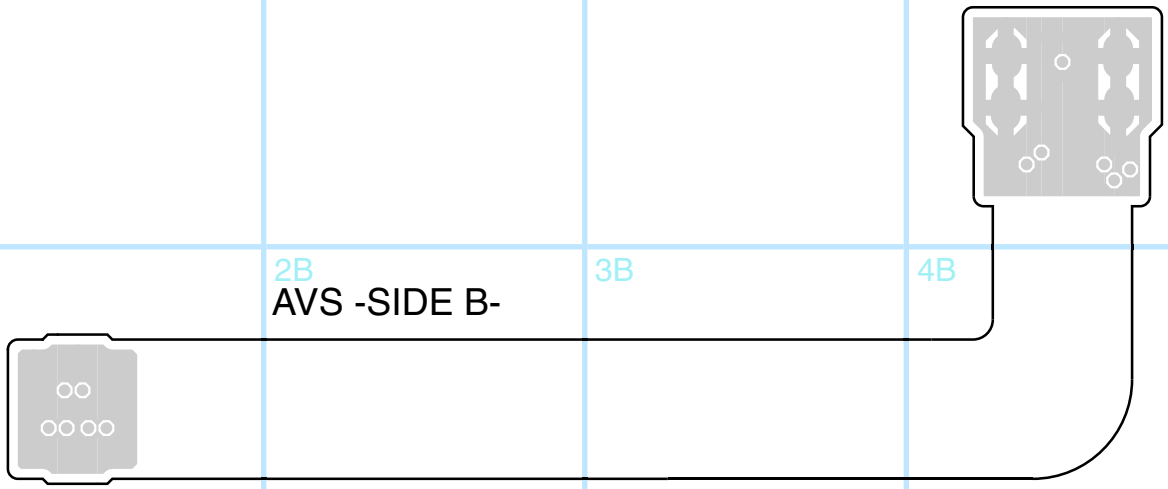


C-4 AVS [Pattern No.JD0091-5]

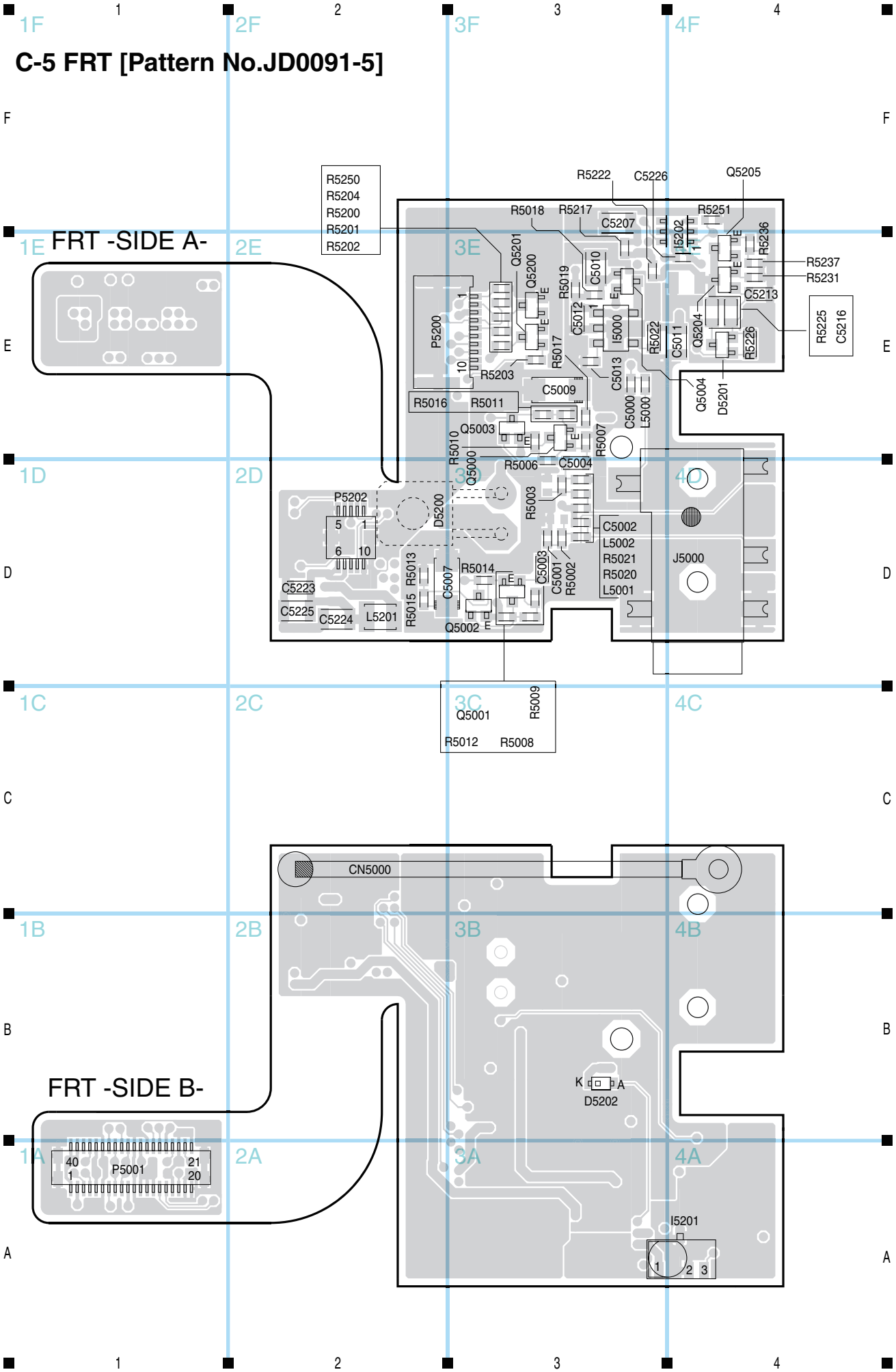
AVS -SIDE A-



AVS -SIDE B-

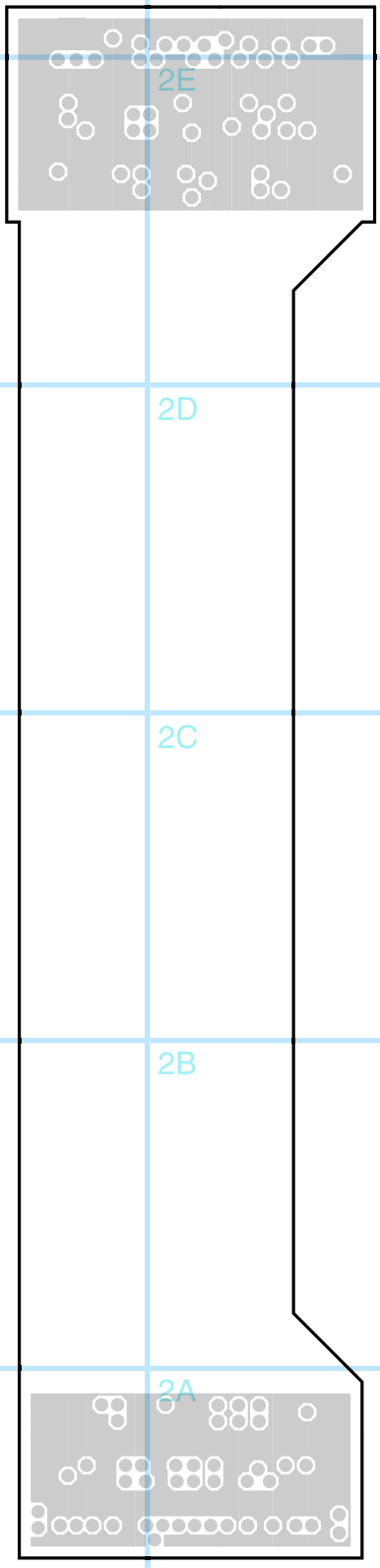


C-5 FRT [Pattern No.JD0091-5]

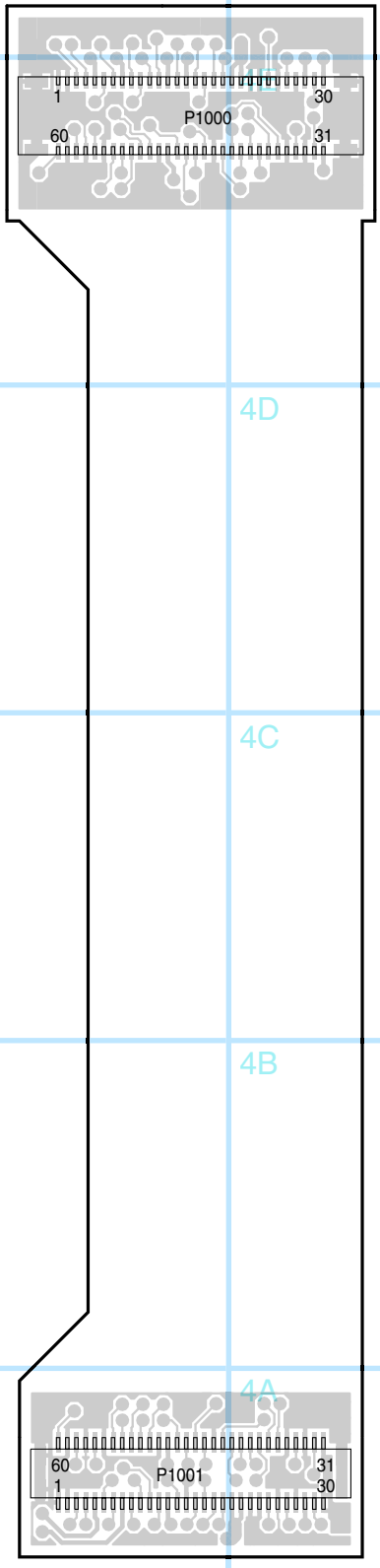


C-6 LAF [Pattern No.JD0091-5]

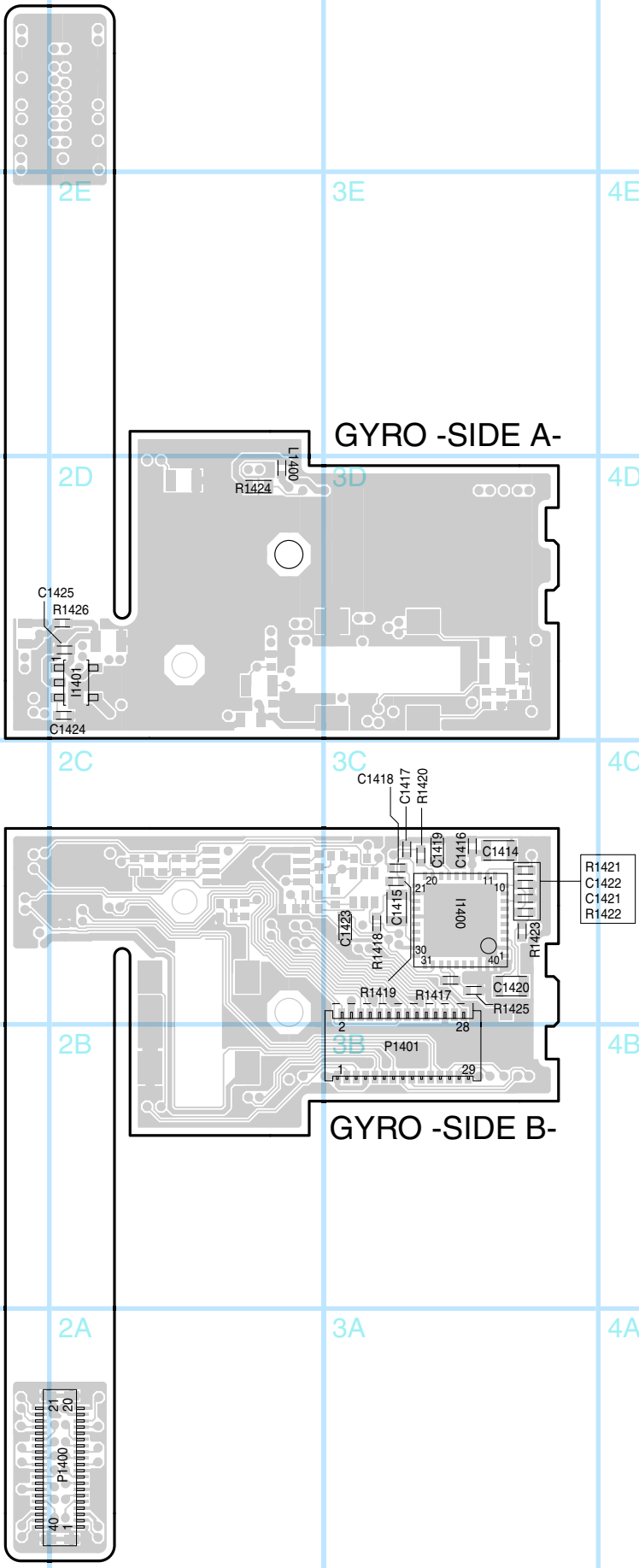
LAF -SIDE A-



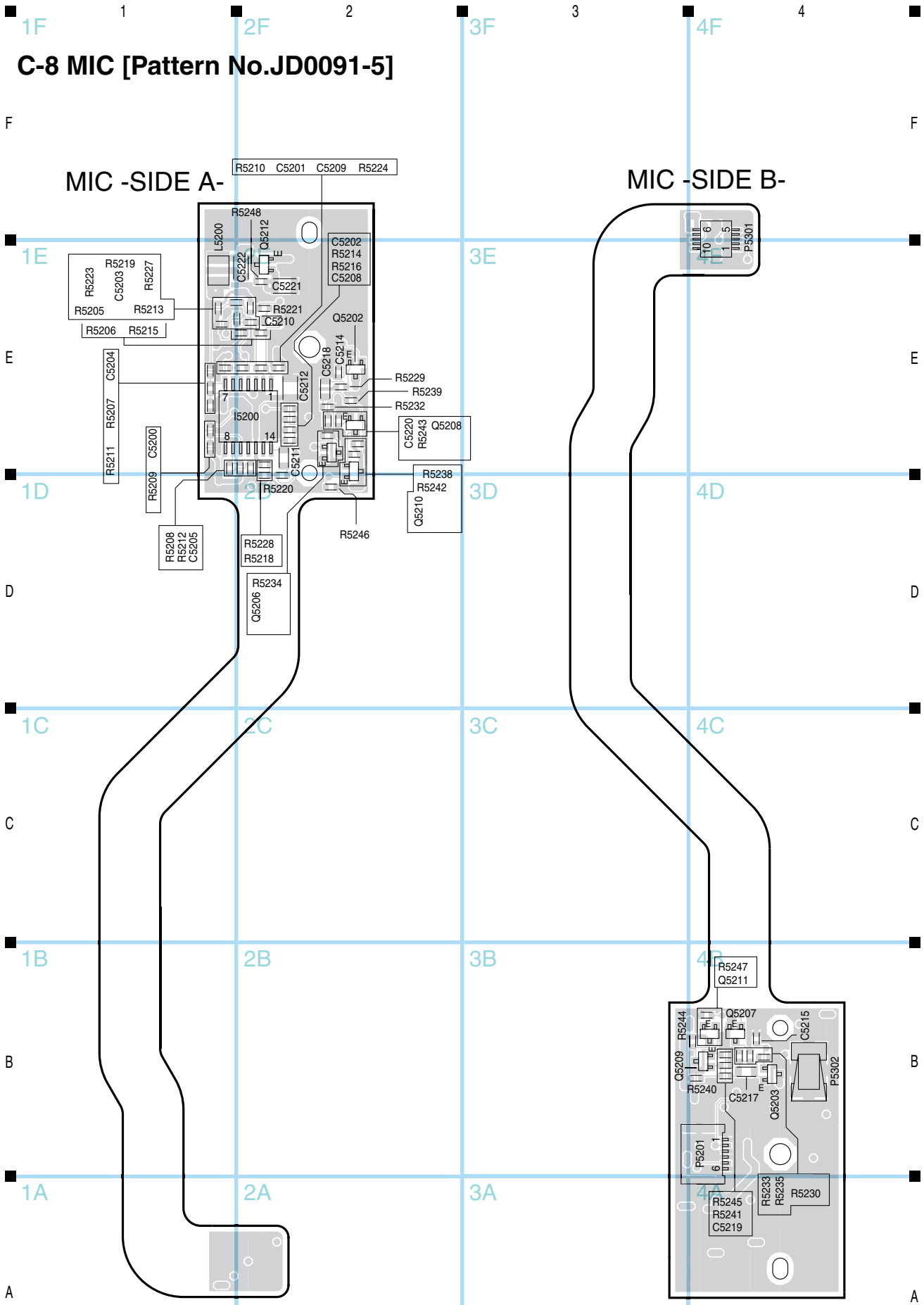
LAF -SIDE B-



C-7 GYRO [Pattern No.JD0091-5]

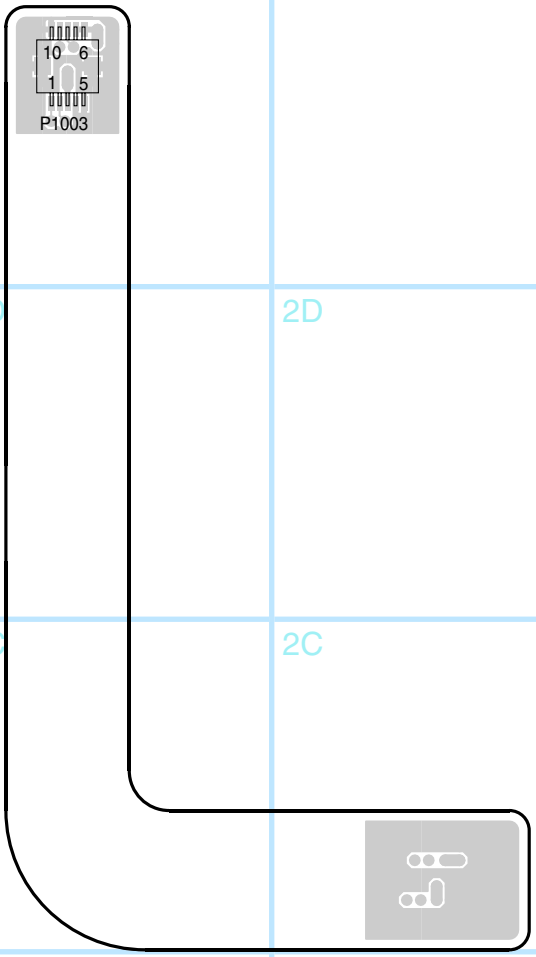


C-8 MIC [Pattern No.JD0091-5]

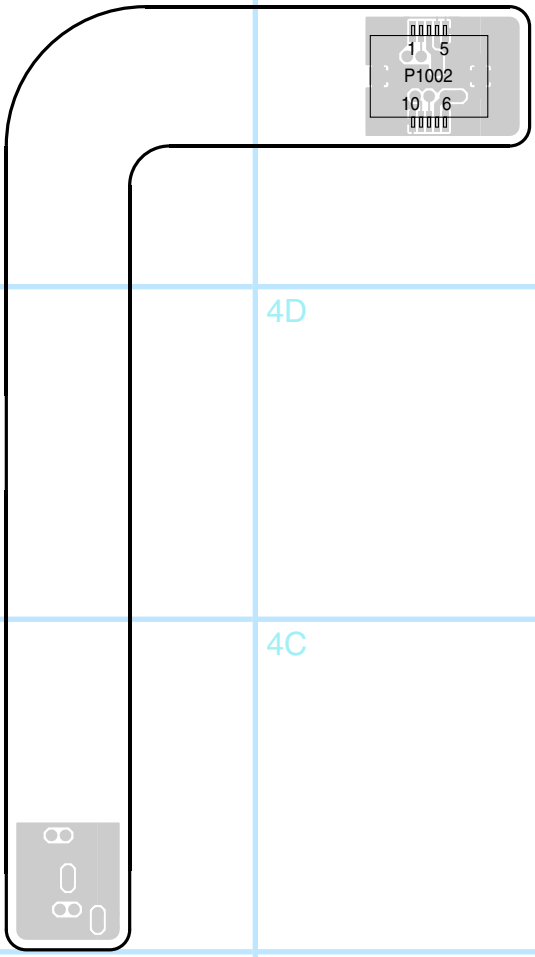


C-9 SFF [Pattern No.JD0091-5]

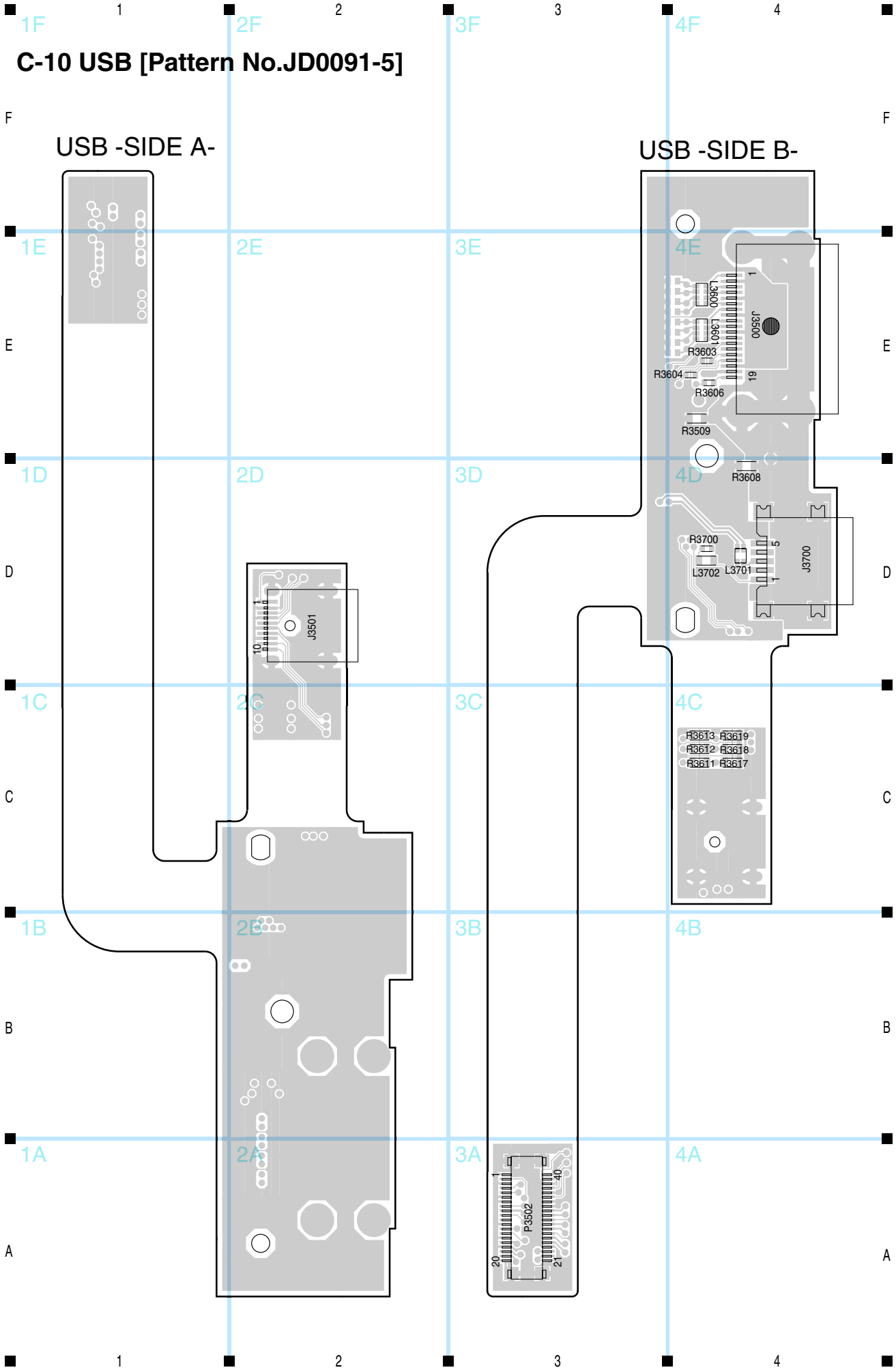
SFF -SIDE A-



SFF -SIDE B-

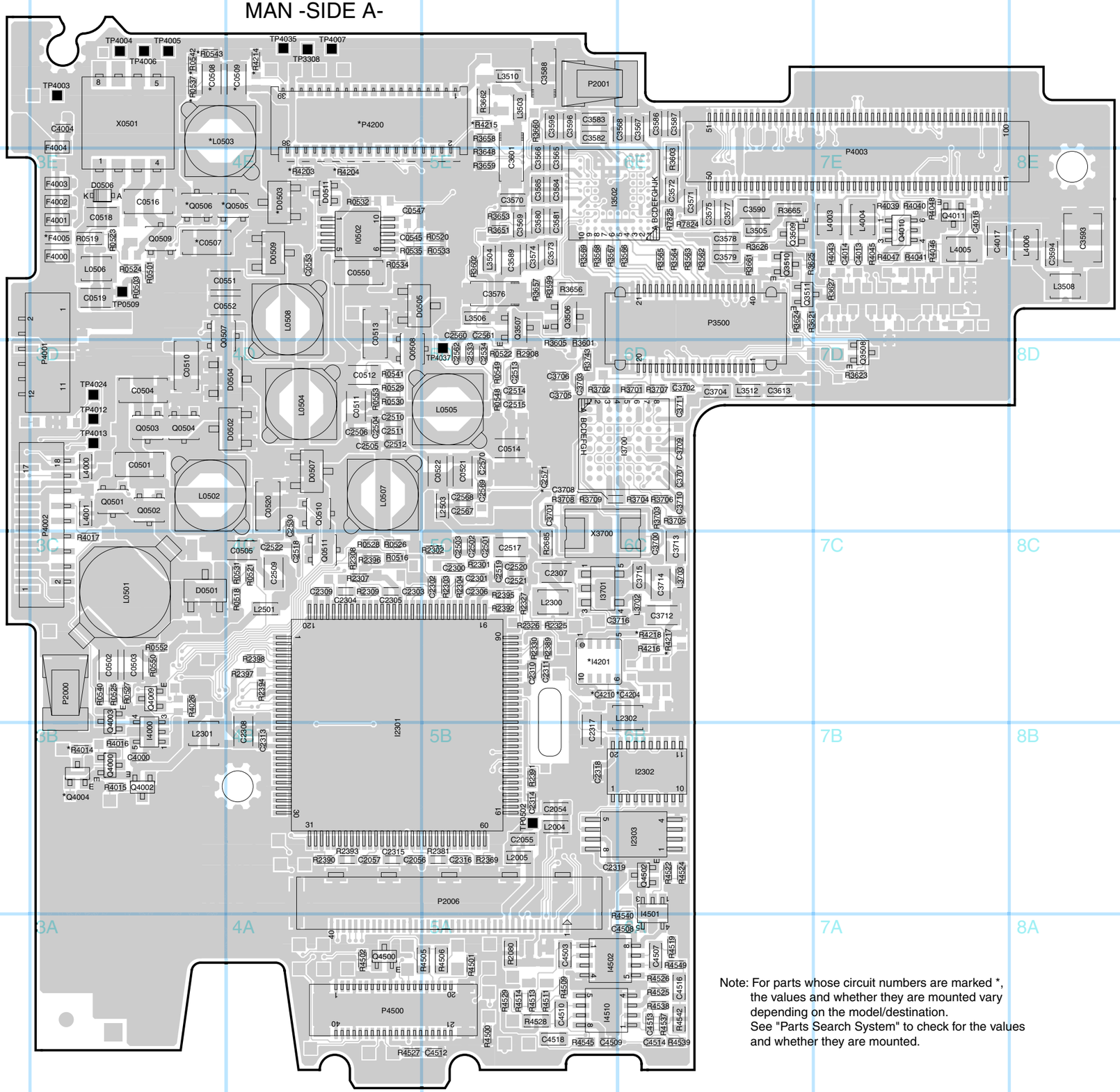


C-10 USB [Pattern No.JD0091-5]



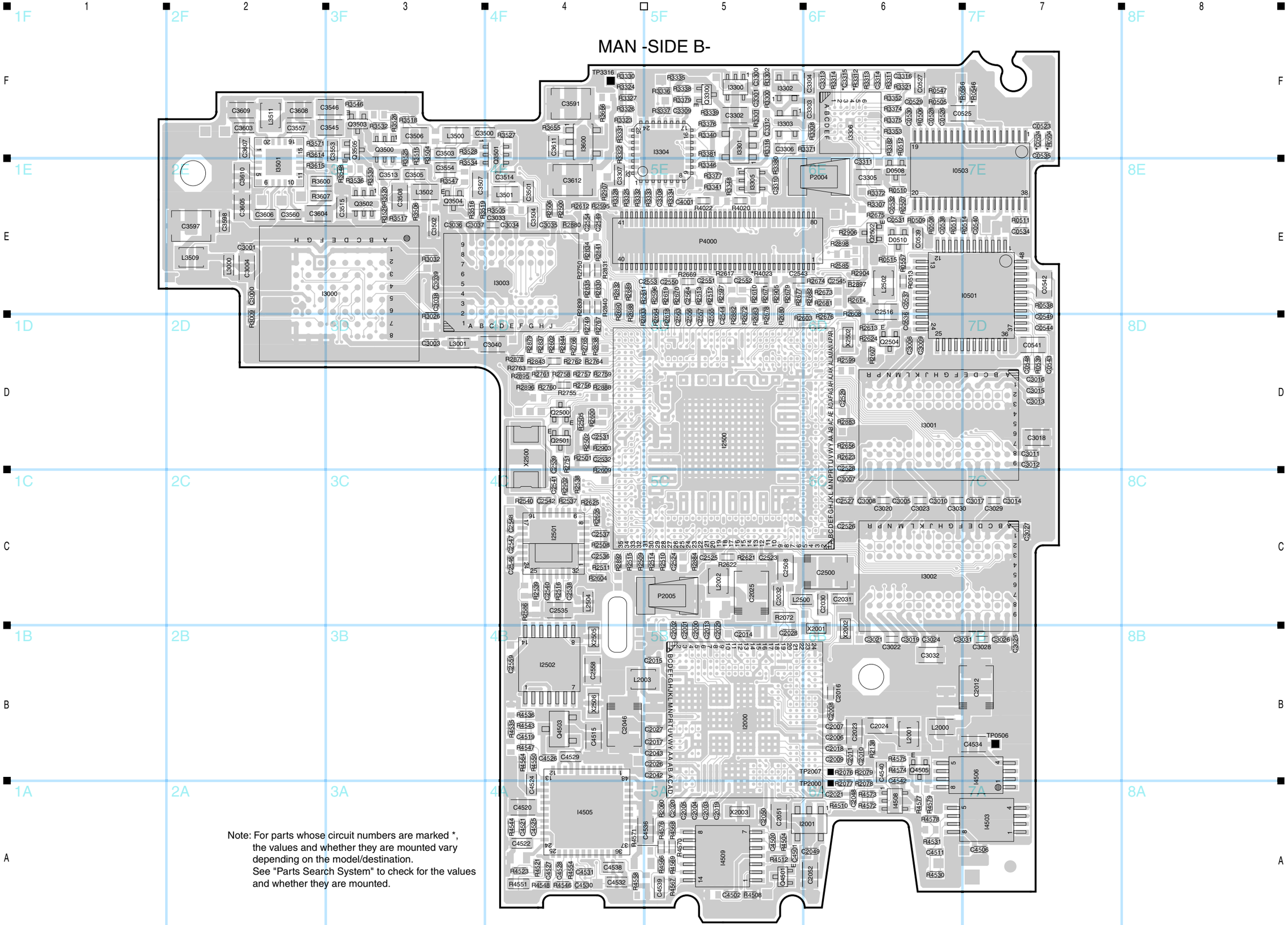
C-11 MAN [Pattern No.JA0814-7]

MAN -SIDE A-



Note: For parts whose circuit numbers are marked *, the values and whether they are mounted vary depending on the model/destination.
See "Parts Search System" to check for the values and whether they are mounted.

MAN -SIDE B-



Note: For parts whose circuit numbers are marked *,
the values and whether they are mounted vary
depending on the model/destination.
See "Parts Search System" to check for the values
and whether they are mounted.

Parts List (See Exploded View for details) Page 7-1

Caution	Symbol No.	Parts No.	Description	Note
	#010	MK13791	SCREW (M1.7X3)	
	#100	KQ05221	LEN ASSY	
	#100A	HP02271	HDD (30GB)	For DZ-BD7HA
⚠	#107	FS11091	BATTERY	
	#110	JD01341	PWB ASSY HDF	For DZ-BD7HA
	#155	DP00822	FLASH UNIT	
	#157	HP02191	BARRIER,LENS	
	#170	HP02171	EVF ASSY	
	#1700	UA00351	DVD DRIVE ASSY (PD1A)	
	#171	MN30983	GASKET	
⚠	#180	QD58732	CASE, REAR	For DZ-BD7HA
⚠	#180	QD58772	CASE, REAR	For DZ-BD70A
	#1GYRL	JP58461	PWB ASSY GYRO	
	#200	UE27621	SENSOR ASSY	
	#200A	NX32401	DAMPER	For DZ-BD7HA
	#210	NX32351	FRAME, LENS	
⚠	#250	QD56382	CASE, SIDE L	For DZ-BD7HA
⚠	#250	QD56384	CASE, SIDE L	For DZ-BD70A
	#251	NJ24832	HOLDER, JACK(L)	
	#252	NA94881	FRAME, JACK	
	#256	NA94861	GROUND PLATE J	
	#257	HP02212	LCD UNIT	
	#258	7773852	SCREW (2X5)	
	#259	NA94851	GROUND PLATE L	
	#271	MK14208	SCREW (1.7X2.5)	
	#280	QD58862	COVER,TOP	
	#283	GH00371	MIC	
	#285	MK13491	SCREW (1.7X4)	
	#290	NJ24821	HOLDE, JACK (F)	
	#2FRTL	JP58471	PWB ASSY FRT	
	#300	MN31211	CUSHION (C197A)	
	#310	QD58631	CASE, SIDE R	For DZ-BD7HA
	#310	QD58644	CASE, SIDE R	For DZ-BD70A
	#310A	MK11911	SCREW (1.7X5)	
	#3SFFL	JP58481	PWB ASSY SFF	
⚠	#400	QD58572	CASE, FRONT	
	#400A	EF26872	CONNECTOR (40P)	
	#450	QX03141	FILTER, IR	
	#4USBL	JP58491	PWB ASSY USB	
	#500	NX32301	RING (O)	
	#590	QD59291	COVER (L)	
	#5LAFL	JP58501	PWB ASSY LAF	
	#600	MC01681	SHEET, LENS	
	#600A	MC01731	SHEET	
	#610	MC01723	SHEET	
	#616	MK14206	SCREW (1.7X4)	
	#620	MC01695	SHEET	
	#6MICL	JP58511	PWB ASSY MIC	
	#700	QX02901	CAP, EYE	
	#7AVSL	JP58841	PWB ASSY AVS	
	#850	QX02931	COVER, ADJUSTMENT	
	#900A	QD58854	COVER, DECORATION	For DZ-BD7HA
	#970	MN30984	GASKET	For DZ-BD7HA
	#980	MN30985	GASKET	
	#AEL	JP58441	PWB ASSY AEL	

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	#BR1	MF03141	SHEET	
	#BR2	MF03143	SHEET	
	#EXL	JP59901	PWB ASSY EXL	
	#HG6	MC10626	RUBBER	
	#HG7	MC01693	SHEET	
	#HG8	MC10628	RUBBER	
	#HG9	MC10629	RUBBER	
⚠	#MAN	JP58432	PWB ASSY MAN-BD7HA	For DZ-BD7HA
⚠	#MAN	JP58762	PWB ASSY MAN-BD70A	For DZ-BD70A
⚠	-	HL11436	REMOTE HAND SET	
⚠	-	EV11004	CORD, ACINLET	
⚠	-	TS19401	AC ADAPTOR (DZ-ACS3)	
	-	EV11011	CORD, DC	
	-	EW12525	CORD, AVS	
	-	MS02031	CLEANING CLOTH	
	-	DN01361	CD-ROM (PC)	
	-	EW08901	CABLE, PCCONNECTION	
	-	EW08781	CABLE, COMPONENT	
	CN5000	EF28622	CONNECTOR	
	D0501	CC00632R	DIODE RB491D	
	D0502	CC00632R	DIODE RB491D	
	D0503	CC00632R	DIODE RB491D	For DZ-BD7HA
	D0504	CC12072R	DIODE SBS004	
	D0505	CC00632R	DIODE RB491D	
	D0506	CC11191R	DIODE 1SS388	
	D0507	CC00632R	DIODE RB491D	
	D0508	5337351	DIODE MA132WK	
	D0509	CC00632R	DIODE RB491D	
	D0510	5337351	DIODE MA132WK	
	D0511	5337351	DIODE MA132WK	
	D4700	5337353	DIODE MA132K	
	D4701	CC03061R	DIODE TLRMV1022	
	D5200	CH12281	DIODE PD410P12E00F	
	D5201	CC13061R	DIODE DAP222	
	D5202	CC03061R	DIODE TLRMV1022	
⚠	F4000	FM10753R	FUSE	
⚠	F4001	FM10751R	FUSE	
⚠	F4002	FM10751R	FUSE	
⚠	F4003	FM10751R	FUSE	
⚠	F4004	FM10751R	FUSE	
⚠	F4005	FM10751R	FUSE	For DZ-BD7HA
	I0501	CK58521R	IC MB39A121PMTGBNDEFE1	
	I0502	CK54161R	IC MP2361DK-LF-Z	
	I0503	CK48061R	IC MB39A110	
	I1001	CK37212R	IC TK11125CSCL	
	I1400	CK53331R	IC IDG-1023A	
	I1401	CK37222R	IC TK11128CSCL-G	
	I2001	CK37212R	IC TK11125CSCL	
	I2302	CK58541R	IC TC74VHC244FK(EL.K)	
	I2303	CK54541R	IC M95320-WDW6TP	
	I2501	CK56021R	IC PLL	
	I2502	CK24261R	IC SN74LVC74APW	
	I3300	CK56591R	IC TC7SB66FU	
	I3301	CK37216R	IC TK11133CSCL	
	I3302	CK49771R	IC S-80952CNNB	
	I3303	CK49771R	IC S-80952CNNB	
	I3304	CK47831R	IC REAL TIME CLOCK	
	I3305	CK27061R	IC TC7SZ08FU	
	I3501	CK58581R	IC AN13208A-VB	

I3600	CK56122R	IC TK70550S	
I3701	CK37212R	IC TK11125CSCL	
I4000	CK27062R	IC TC7SZ32FU	
I4201	CK58951R	IC HAAM-327B	For DZ-BD7HA
I4501	CK56591R	IC TC7SB66FU	
I4502	CK49831R	IC NJM13404R-TE1	
I4503	CK49841R	IC NJM3414AV-TE1	
I4506	CK49211R	IC M62343GP	
I4509	CK49821R	IC NJM13403V-TE1	
I4510	CK49831R	IC NJM13404R-TE1	
I4700	CK43974R	IC NJM2872AF25	
I4701	CK37214R	IC TK11131CSCL	
I4703	CK55521R	IC AK4568A	
I4705	CK56351R	IC LB1935CL	
I5000	CK37212R	IC TK11125CSCL	
I5200	CK49891R	IC NJM2112V-TE1Z	
I5201	CE00211R	IC RPMS2381-H19	
I5202	CK53613R	IC TC7PA17FU	
J1000	EA15291R	PLUG	
J3500	EY02381R	JACK	
J3501	EY02411R	JACK	
J3700	EY11801R	JACK, USB	
J5000	ER01081R	JACK	
J5001	EY11581R	JACK (8P)	
L0501	BA02671R	COIL	
L0502	BA11972R	COIL	
L0503	BA11974R	COIL	For DZ-BD7HA
L0504	BA11973R	COIL	
L0505	BA11974R	COIL	
L0506	BA02367R	COIL	
L0507	BA11971R	COIL	
L0508	BA11971R	COIL	
L1000	BM00618R	COIL [EXL]	
L1000	BM00334R	COIL [5MCMOS]	
L1001	BM00334R	COIL	
L1400	BM00619R	COIL	
L2000	BM00334R	COIL	
L2001	BA02367R	COIL	
L2002	BA02367R	COIL	
L2003	BA02363R	COIL	
L2005	BM10347R	COIL	
L2300	BA02367R	COIL	
L2301	BA02367R	COIL	
L2302	BA02367R	COIL	
L2500	BM00131R	FILTER	
L2501	BM00131R	FILTER	
L2502	BA02367R	COIL	
L2503	BM00131R	FILTER	
L2504	BM00131R	FILTER	
L3000	BM00131R	FILTER	
L3001	BM00131R	FILTER	
L3500	BA00832R	COIL	
L3501	BA00832R	COIL	
L3502	BA00832R	COIL	
L3503	BM00131R	FILTER	
L3504	BM10344R	COIL	
L3505	BM10344R	COIL	
L3506	BM10344R	COIL	
L3508	BA02367R	COIL	

L3509	BA02367R	COIL	
L3510	BM00131R	FILTER	
L3511	BA02367R	COIL	
L3512	BM10347R	COIL	
L3601	BM11081R	COIL	
L3702	BM00608R	COIL [USB]	
L3702	BE10134R	COIL 180UH [MAN]	
L3703	BM00608R	COIL	
L4000	BM00131R	FILTER	
L4001	BM00131R	FILTER	
L4003	BA02337R	COIL	
L4004	BA02355R	COIL	
L4005	BA02344R	COIL	
L4006	BA02367R	COIL	
L4700	BM10349R	COIL	
L4701	BM00618R	COIL	
L4702	BM10349R	COIL	
L4703	BM00618R	COIL	
L4705	BM00618R	COIL	
L4706	BM10349R	COIL	
L4707	BM10349R	COIL	
L4716	BA02371R	COIL	
L4717	BA02367R	COIL	
L4718	BA02367R	COIL	
L4719	BA02367R	COIL	
L4720	BA02372R	COIL	
L4721	BA02367R	COIL	
L4722	BM00608R	COIL	
L4723	BA02367R	COIL	
L4724	BA02367R	COIL	
L5000	BM00619R	COIL	
L5001	BM00619R	COIL	
L5002	BM00619R	COIL	
L5200	BA00894R	COIL	
L5201	BA02361R	COIL	
OF1001	DT00851	CRYSTAL	
P001	EA16311R	PLUG	
P1000	EA15025R	PLUG [EXL]	
P1000	EA03622R	PLUG [5MCMOS]	
P1001	EA15035R	PLUG [LAF]	
P1001	EA04232R	PLUG [EXL]	
P1002	EA16301R	PLUG [SFF]	
P1002	EA02751R	PLUG [EXL]	
P1003	EA16311R	PLUG [SFF]	
P1003	EA04493R	PLUG [EXL]	
P1004	EA15091R	PLUG	
P1400	EA15037R	PLUG	
P1401	EA04232R	PLUG	
P2000	FU10501R	CONTACT	
P2001	FU10501R	CONTACT	
P2004	FU10501R	CONTACT	
P2005	FU10501R	CONTACT	
P2006	EA03622R	PLUG	
P3502	EA13692R	PLUG	
P4000	EA16192R	PLUG	
P4001	EA15385R	PLUG	
P4002	EA15381R	PLUG	
P4003	EA15002R	PLUG	
P4200	EA04235R	PLUG	For DZ-BD7HA

P4500	EA15027R	PLUG	
P4702	EA15381R	PLUG	
P4705	EY02511R	JACK	
P4707	EA03861R	PLUG	
P4708	EA16301R	PLUG	
P4709	EA16301R	PLUG	
P4710	EA15027R	PLUG	
P4711	EA15035R	PLUG	
P5001	EA15037R	PLUG	
P5201	EA15601R	PLUG	
P5202	EA16311R	PLUG	
P5301	EA16311R	PLUG	
P5302	FU10501R	CONTACT	
Q0501	CA13501R	TRANSISTOR MCH3310-TL	
Q0502	CA14131R	TRANSISTOR MCH3408	
Q0503	CA13501R	TRANSISTOR MCH3310-TL	
Q0504	CA14131R	TRANSISTOR MCH3408	
Q0505	CA13501R	TRANSISTOR MCH3310-TL	For DZ-BD7HA
Q0506	CA14131R	TRANSISTOR MCH3408	For DZ-BD7HA
Q0507	CA13501R	TRANSISTOR MCH3310-TL	
Q0508	CA13501R	TRANSISTOR MCH3310-TL	
Q0509	CA14311R	TRANSISTOR MCH3414	
Q0510	CA13501R	TRANSISTOR MCH3310-TL	
Q0511	CA14131R	TRANSISTOR MCH3408	
Q1000	CA14431R	TRANSISTOR RT1P144U	
Q2500	CA14441R	TRANSISTOR RT1N144U	
Q2501	CA03183R	TRANSISTOR RT1N441U	
Q2502	CA03183R	TRANSISTOR RT1N441U	
Q2504	CA14441R	TRANSISTOR RT1N144U	
Q3300	CA14091R	TRANSISTOR 2SC5343E-CL	
Q3500	CA02111R	TRANSISTOR SUT483J	
Q3503	1323293	TRANSISTOR 2SC4617 (R/S)	
Q3506	CA01011R	TRANSISTOR 2SK3018	
Q3507	CA01011R	TRANSISTOR 2SK3018	
Q3508	CA14441R	TRANSISTOR RT1N144U	
Q3509	CA14441R	TRANSISTOR RT1N144U	
Q3510	CA14441R	TRANSISTOR RT1N144U	
Q3511	CA14091R	TRANSISTOR 2SC5343E-CL	
Q4000	CA14431R	TRANSISTOR RT1P144U	
Q4002	CA14431R	TRANSISTOR RT1P144U	
Q4003	CA14441R	TRANSISTOR RT1N144U	
Q4004	CA14431R	TRANSISTOR RT1P144U	For DZ-BD7HA
Q4009	CA14431R	TRANSISTOR RT1P144U	
Q4010	CA02161R	TRANSISTOR SUT485J	
Q4011	CA14451R	TRANSISTOR 2SA1989	
Q4500	CA12504R	TRANSISTOR 2SC5383	
Q4501	CA14091R	TRANSISTOR 2SC5343E-CL	
Q4502	CA14441R	TRANSISTOR RT1N144U	
Q4503	CA14151R	TRANSISTOR 2SB1705TL	
Q4700	1323292	TRANSISTOR 2SA1774	
Q4701	1323292	TRANSISTOR 2SA1774	
Q4702	1323292	TRANSISTOR 2SA1774	
Q4703	CA14431R	TRANSISTOR RT1P144U	
Q5000	CA14091R	TRANSISTOR 2SC5343E-CL	
Q5001	CA14091R	TRANSISTOR 2SC5343E-CL	
Q5002	CA14121R	TRANSISTOR 2SA1980EF-AY	
Q5003	CA14121R	TRANSISTOR 2SA1980EF-AY	
Q5004	CA14091R	TRANSISTOR 2SC5343E-CL	
Q5200	CA12504R	TRANSISTOR 2SC5383	

Q5201	CA12504R	TRANSISTOR 2SC5383
Q5202	CA14091R	TRANSISTOR 2SC5343E-CL
Q5203	CA14091R	TRANSISTOR 2SC5343E-CL
Q5204	CA11373R	TRANSISTOR 2SD2345JSL
Q5205	CA12503R	TRANSISTOR 2SC5383
Q5206	CA14421R	TRANSISTOR RT1N241U
Q5207	CA14421R	TRANSISTOR RT1N241U
Q5208	CA14091R	TRANSISTOR 2SC5343E-CL
Q5209	CA14091R	TRANSISTOR 2SC5343E-CL
Q5210	CA14091R	TRANSISTOR 2SC5343E-CL
Q5211	CA14091R	TRANSISTOR 2SC5343E-CL
Q5212	CA14091R	TRANSISTOR 2SC5343E-CL
S1000	FB00181R	SWITCH
S1001	FB00181R	SWITCH
S1002	FB00181R	SWITCH
S1003	FB00181R	SWITCH
S1004	FB00181R	SWITCH
S1005	FB00181R	SWITCH
S1006	FB00181R	SWITCH
S1007	FB00181R	SWITCH
X0501	BC10571R	TRANS
X2001	BK00284R	FILTER
X2002	BK00284R	FILTER
X2500	BL01621R	CRYSTAL
X2502	BK00283R	FILTER
X2505	BK00282R	FILTER
X2506	BK00282R	FILTER
X3700	BL11681R	CRYSTAL

HITACHI

DZ-BD7HA
DZ-BD70A

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